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DOS WORLD

The PC Productivity Magazine

November 1994
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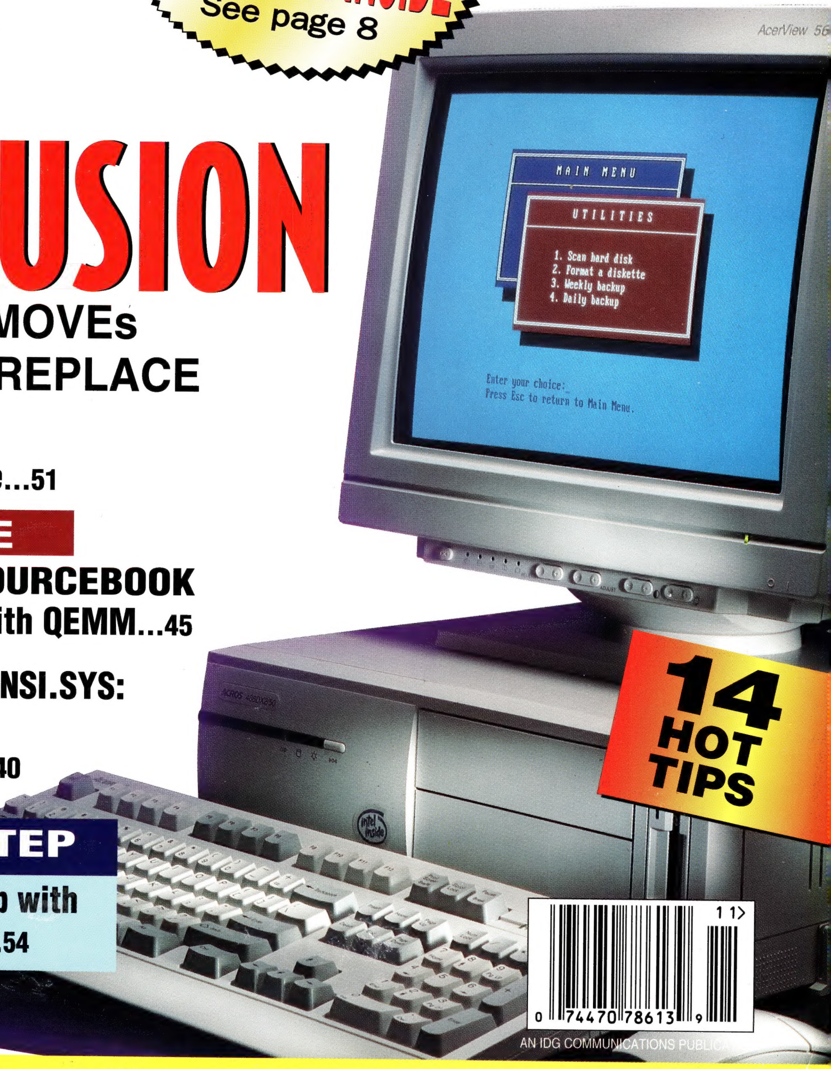

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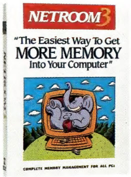
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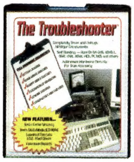

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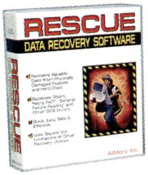

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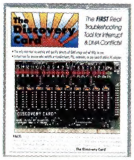
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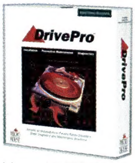

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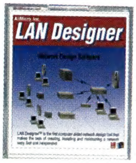

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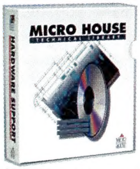

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DOS WORLD

Number 18, November 1994

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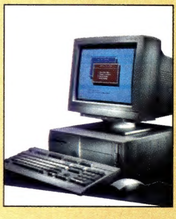

COVER PHOTO BY LARRY DUNN

DW

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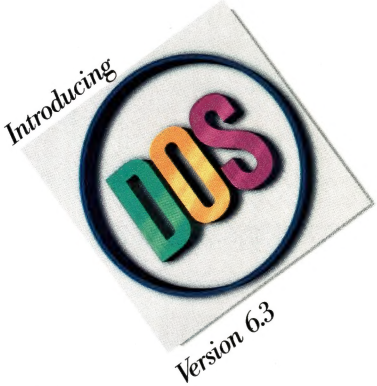

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Michael J. Comendul
SENIOR EDITOR
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Hilory Wagner
COPY/PRODUCTION EDITOR
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EDITOR AT LARGE
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ARTICLE EDITORS
Patricia Cummings, Beth S. Jala, Marilyn McMaster
TECHNICAL EDITORS
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CONTRIBUTING EDITORS
Dan Gookin, Robert Hummel, Doug Lowe, Stan Miastkowski

ELECTRONIC PUBLISHING
Lindy P. Greenwood
DESIGN/PRODUCTION CONSULTANT
Marilyn Fletcher

PUBLISHER
Stephen Robbins
WESTERN SALES REPRESENTATIVE
Ed Winchell
333 Canham Road, Scotts Valley, CA 95066
Tel./Fax (408) 438-5653
SALES REPRESENTATIVE
Linda M. Guyette
(603) 924-0325, (800) 343-0728
SALES REPRESENTATIVE
Laurie Donohue
(603) 924-0329, (800) 343-0728
LIST SALES REPRESENTATIVE
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Business Computer Publishing Inc.

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Jeff DeTray
EDITORIAL DIRECTOR
Michael J. Comendul
CIRCULATION MANAGER
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CUSTOMER SERVICE
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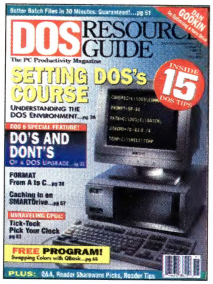
EDITORIAL

Making the Break

by Michael J. Comendul

The world of DOS is changing, and we're changing with it. Our new name, *DOS World*, signals this shift, but we're making some changes inside as well. In the course of our three years of publishing *DOS Resource Guide*, we've heard from a great many readers, and those who haven't called have written. Others among you have taken the time to fill out our "you be the editor" card in the back of the magazine. From all of these sources and many conversations, the editors have identified some new areas of coverage that I hope you're going to enjoy, as well as find useful.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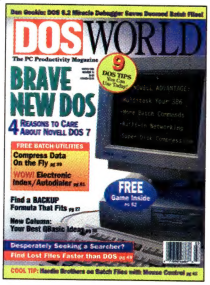
We're broadening our coverage to include tips on popular utilities. In issues to come you'll see more product-upgrade news—news that isn't being covered in major computer magazines. You'll find out where to get the latest versions of DOS programs and what they cost. We'll include short reports of interest to DOS users, announcements about incompatibilities among DOS programs (or DOS programs running with Windows), and more reports about using on-line services. To keep you abreast of changes in the wider world of computing, we're going to continue covering Windows topics you need to know about.

But the main thrust of the magazine won't be changing. We'll be talking about DOS and how to use it wisely, and finding new and different batch-file techniques. We'll continue looking for QBasic utilities and games we hope are both educational and fun. And, of course, our readers will continue to share their best DOS tips with you.


Dan Gookin: DOS 6.2 Miracle Debugger Saves Doomed Batch Files!
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COOL TIP: Hardin Brothers on Batch Files with Mouse Control

In this issue we've added the first of our "Utilities Sourcebooks" ("Maximizing Memory with QEMM," page 45). In this issue and in issues to come, you'll find tips for using popular DOS utilities, instructions for setting them up, and hints on getting more mileage out of them in your computing day. We'll be adding tips for going on line and tips for working with communications programs as well. As we have in the past, *DOS World* will find room in this section for contributions from its readers. Send us your nominations for an essential utility and two or three tips for using the program. Naturally, the magazine will pay for any of the tips it uses.

As we move forward, the editors are trying to make the magazine more accessible to the newcomer and the student of personal computing, but just as useful to the hacker: not an easy balance to maintain. In the new *DOS World* you'll still find the answers to your computing questions, and you'll find the most authoritative voices we can muster to the task. If we veer off course, I'm sure you'll let us know. ■

DOS WORLD

Letters to the Editor

In Case of Emergency . . .

I've been thinking about a comment made in "Reader Forum" concerning adding AUTOEXEC.BAT and CONFIG.SYS files to an emergency bootup disk [*DRG/DOS World* #13, January 1994, page 14].

I still use MS-DOS version 5, and the only files I find necessary are MSDOS.SYS, IO.SYS, and COMMAND.COM. If you choose to include AUTOEXEC.BAT or CONFIG.SYS, make them simple.

This approach has two advantages. A simple start-up disk never needs changing, and if you don't change your start-up disk, you won't introduce commands that prevent your system from booting. For example, at the place where I work, a problem arose with a device driver on one of our machines. We couldn't boot from the emergency disk because an updated CONFIG.SYS had been written to the disk.

Which brings me to another recommendation: Boot from your emergency disks after creating them—just to make sure they work.

My AUTOEXEC.BAT has two lines:

```
PROMPT $P$G
VER
```

and my CONFIG.SYS looks like this:

```
COUNTRY=001
FILES=30
```

I agree that if you store CONFIG.SYS and AUTOEXEC.BAT on your emergency disk, you should save them with nonexecutable extensions.

David A. Priest
East Jordan, Mich.

It's worth noting that some users may need to include an extra line or two to ensure that they can access the configuration files on their hard disks. Certain disk-compression programs and hard-disk partition programs, for example, require that CONFIG.SYS contain a device command. The associated SYS file must also reside on the boot floppy. You can boot your system if your floppy disk lacks these two elements, but the information on your hard disk won't be accessible.

—Hardin Brothers

A Matter of Interpretation

In his March 1994 "PC Toolbox" ["Take a Letter . . . and Redirect It," *DRG/DOS World* #14, page 34], Robert L. Hummel describes how he helped a friend find out the date of several computers' BIOS chips. His solution was to create a utility called KEYPUT.COM, which stuffs the keyboard buffer and passes commands to DOS's Debug program.

The following four-line QBasic program simplifies this task:

```
DEF SEG=&HF000
FOR J=&HFFF5 TO &HFFFF
PRINT CHR$(PEEK(J));
NEXT J
```

Bud Lorch
St. Thomas, Ontario
Canada

Two for One

If you follow Robert L. Hummel's instructions [in "Take a Letter . . . and Redirect It"], you wind up typing in two programs that total 263 bytes. You can accomplish the same end with two files. First, create this two-line file, DATE.SCR:

```
D FFFF:5 L8
Q
```

Then create a second file, BIOSDATE.BAT, containing these two lines:

```
@ECHO OFF
DEBUG < DATE.SCR
```

I'm sure users will find my way faster than typing in KEYPUT.SCR.

Carl F. Tegeder Jr.
APO, AE 09139

Short and Sweet

I found Robert L. Hummel's method of printing the BIOS date [in "Take a Letter . . . and Redirect It"] to be more complex than necessary. I'd like to share a short Debug program that prints the BIOS date directly.

First, create a file named BIOSDATE.SC containing these lines:

```
N BIOSDATE.COM
A 100
MOV AX,FFFF
MOV DS,AX
MOV DX,5
MOV BX,1
MOV CX,8
MOV AH,40
INT 21
MOV AH,4C
INT 21

RCX 16
W
Q
```

To create the executable file BIOSDATE.COM, use the following command to run Debug:

```
DEBUG < BIOSDATE.SCR
```

David Potter
Wenatchee, Wash.

All the Debug utilities I present in my "PC Toolbox" column are developed to solve real-world computing problems. KEYPUT.COM *is no exception. But my intention wasn't to find a way to read the BIOS date. Instead, I wanted to create a tool I could use to put keystrokes into the keyboard buffer without typing them in.* KEYPUT.COM *has many other uses besides retrieving BIOS information. Still, it's gratifying to see the innovative ways* DOS World *readers found for displaying BIOS data.*

—Robert L. Hummel

OMISSIONS AND CORRECTIONS

In Search of a Missing Menu

In your recent special issue, *Running DOS and Windows in Harmony*, Doug Lowe's article, "Putting the Squeeze on Windows" [February 1994, page 86], says that File Manager's Tools menu contains a DoubleSpace Info option. I've looked high and low, but I can't find that menu. I'm using MS-DOS 6.2 and Windows 3.1.

Ron Holmes
Guelph, Ontario

The Tools menu is added to Windows' File Manager only when MS-DOS 6.x is installed on a computer on which Windows already resides. I suspect that you purchased a new computer that came with MS-DOS 6.2 and Windows 3.1 installed. Before shipping a new computer to a customer, the machine's vendor typically installs MS-DOS first and then Windows. Because Windows isn't present when DOS is installed, the Tools menu isn't created.

You can rectify this situation by retrieving your DOS installation disks, inserting disk 1, and typing `A:SETUP /E` *(use* `B:SETUP /E` *if you're working from drive B). Follow the on-screen instructions for installing the Windows versions of Backup, AntiVirus, and Undelete. During the process, DOS will add the Tools menu to File Manager. Sorry about the confusion.*

—Doug Lowe

Fixer-Uppers

Minor errors crept into three listings published in recent issues of the magazine. In the Maximum DOS *special issue (June 1994), the batch-file line at the top of the second column on page 38 should read as follows:*

```
IF ERRORLEVEL 1 COPY
  C:\SCANDISK.LOG PRN
```

Also in that issue, line 250 of the screen-saver program, SCREEN.BAS *(page 71), is incorrect. It should read as follows:*

```
IF X2 > 640 OR X2 < 1
  THEN X2DIFF = X2DIFF * -1
```

The DOS tip "A More Readable PATH" (DRG/DOS World *#16, July 1994, page 78) is missing a percent sign. The next-to-the-last line of the program should read as follows:*

```
FOR %%V IN (%PATH%) DO ECHO    %%V
```

Also in that issue, we inadvertently omitted key features of the latest version of FastTrax (page 58 in "The 2nd Annual Guide to Utilities"). Version 5.0 now offers two operating levels: normal for occasional users who want simple menu control, and advanced for power users. The software provides DOS and DoubleSpace/DriveSpace maps, with an inspection feature that reveals fragmented files and bad clusters. Also included are color, mouse support, and enhanced Windows and OS/2 support.

In issue #17 (September 1994), the last two lines of the DOS tip "Systematic Trash Removal" (p. 25) below CLS *should read as follows:*

```
@ECHO Files with the extension
  BAK were moved to \TRASHCAN.
:END
```

Also in that issue, the last program line in the DOS tip "A Temporary Fix" (page 48) contains an extraneous redirection character. It should read as follows:

```
ECHO Y|DEL C:\DOS\TEMP
```

—Eds.

Once More, with Accuracy

ONCE.BAT *["Tips from Readers,"* DRG/DOS World *#16, July 1994, page 7], a batch file that automates daily computing chores, contains two errors in the listing's third line.*

First, you may omit ECHO N |. *Unlike the file-comparison utility* COMP.EXE, FC.EXE *doesn't issue a "Compare more files (Y/N)?" prompt after comparing two files. As a result, you don't need to echo a negative response.*

In addition, a space should precede the n *in* no. *The corrected line should read:*

```
FC NOW.DAT TST.DAT | FIND " no" > NUL
```

This command uses FC *to compare* NOW.DAT, *which always holds the current date, and* TST.DAT, *which holds a date that's updated only when you run* ONCE.BAT *and the system date has changed.*

The first time you run ONCE.BAT, TST.DAT *doesn't exist. (It's created in the program's sixth line.) If you omit the space, when you first run the program,* FIND *locates the word* cannot *within* FC*'s "*FC *cannot open filename" message (because* TST.DAT *doesn't exist yet). Adding a space ensures that* FIND *will locate the word* no *when DOS issues the message "*FC: *no differences encountered," which is displayed when the date hasn't changed.*

—Eds.

DOS WORLD

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DOS WORLD

Tips from Readers

Jump to It

If you're one of those people who makes new directories often with the MD command and forgets to use CD to change to the new directory before you start copying to it, you might appreciate my simple jump-directory batch file, JD.BAT:

```
@ECHO OFF
CLS
MD %1
CD %1
```

Using it couldn't be simpler. For example, when you're in the root directory and want to create a directory called C:\NEW, then switch into it, type `JD NEW`. (JD.BAT must be in the current directory or in a directory listed in your DOS PATH statement.)

Mark Kingsbury
Battle Creek, Mich.

The Next Best Thing To Being There

When I want to defragment a hard disk that was compressed with DoubleSpace, but can't sit at my computer answering prompts, I use the following batch file:

```
@ECHO OFF
SCANDISK H: C: /AUTOFIX /NOSAVE
 /NOSUMMARY
DEFRAG C: /F
DBLSPACE /DEF
DBLSPACE /DEF /F
DBLSPACE /DEF
```

Because I want to be sure that the disk is free of defects *before* I move files around, I wrote the batch file so that it runs ScanDisk first. The H: and C: parameters tell ScanDisk to examine the DoubleSpace host, drive H, and the compressed drive, drive C. If you omit H:, ScanDisk asks whether you want to scan the host drive; it won't proceed until it receives a response.

/AUTOFIX, /NOSAVE, and /NOSUMMARY tell the program to fix errors automatically, without saving any lost clusters it finds or displaying summary information.

Unfortunately, using the last switch leaves you without UNDO information, but this is the only way you may run the program unattended.

The next line asks DEFRAG for a full compression of drive C, which places all files in contiguous sectors at the beginning of the hard disk. The free space is at the end of the disk.

The three DBLSPACE commands are the sequence Microsoft recommends for getting the most complete defragmentation of a compressed DoubleSpace drive.

James Evans
Oakland, Calif.

Two for One

By trial and error, I discovered that when a program feeds a string containing an equal sign (=) and no blanks to a batch file as a parameter, DOS removes the equal sign and replaces it with a blank. In effect, DOS makes two or more parameters out of one.

I was trying to use this quirk when I discovered that DOS also ignores an equal sign placed between the name of a batch file and its parameter. This happens both when you call the batch file from the command line and when you call it from another batch file.

I used the latter peculiarity to create a batch file that saves the current screen mode in environment variables (%NLINES% and %NCOLS%), changes the screen mode to whatever the particular application requires, runs the application, and changes back to the original screen mode after you exit the program. Several steps are involved.

First, I used this command to create a batch file and named it MAKEBAT.BAT:

```
COPY CON MAKEBAT.BAT
```

pressing Enter at the end of the line. I then typed MAKEBAT's only line:

```
CALL %1
```

pressing the spacebar once, the Ctrl+Z key combination twice, and Enter once. This batch file calls the batch file you name as a parameter when you call MAKEBAT.

For example, if you type `MAKEBAT FILE`, MAKEBAT executes the command CALL FILE. (The two Ctrl+Z characters here prevent DOS from storing a carriage return/linefeed at the end of the CALL command.)

Next, I created another one-line batch file, LINES.BAT:

```
COPY CON LINES.BAT
SET NLINES=%1
```

pressing Enter at the end of the first line and Ctrl+Z and Enter at the end of the second.

Finally, I created another batch file that uses this sequence to get current mode settings:

```
COPY C:\BAT\MAKEBAT GETMODE
  > NUL
MODE CON | FIND "Lines"
  >> GETMODE
CALL GETMODE
```

If the current mode has 25 lines, GETMODE will contain this command:

```
CALL Lines=25
```

DOS interprets this as a command to call LINES.BAT:

```
CALL LINES 25
```

which executes this command:

```
SET NLINES=25
```

To set the variable %NCOLS%, I used a similar procedure, modifying GETMODE to find COLUMNS= and creating a file named COLUMNS.BAT, which contains this command:

```
SET NCOLS=%1
```

John Fischer
Nepean, Ontario
Canada

Space Savings Revisited

Vagn Grøndahl's tips for combining several batch files to save space ["All Together Now" in "Tips from Readers," *DRG/DOS World* #15, May 1994, page 13] was excellent.

However, because some batch files need parameters, I suggest adding the following lines after the second line of Grøndahl's batch file:

```
SET BATCHGO2=%1
SHIFT
```

Then change the third line to read as follows:

```
GOTO %BATCHGO2%
```

Finally, after the next-to-the-last line, add this line:

```
SET BATCHGO2
```

These alterations create an environment variable called BATCHGO2, which the batch file uses to transfer control to the appropriate section. After DOS executes that section, it shifts the next parameter (if there is one) into position and executes that section. After DOS executes all appropriate sections of the batch file, it deletes the environment variable.

If you're tight on environment space, you may delete BATCHGO2 in each section, instead of waiting until the end of the batch file.

Karl Holger
Jacksonville, Fla.

Staying on the Path

If you need to disable AUTOEXEC.BAT—perhaps because you're trying to resolve a conflict between an application and a memory-resident program—you don't have to sacrifice your PROMPT and PATH statements, too. Before you rename or move AUTOEXEC.BAT, consider the technique presented here to store your current PROMPT and PATH settings in a batch file called SETPATH.BAT.

The batch file requires four lines:

```
ECHO @ECHO OFF > SETPATH.BAT
ECHO prompt >> SETPATH.BAT
ECHO PATH=path >> SETPATH.BAT
CALL SETPATH
```

The single greater-than symbol (>) creates and names the batch file, erasing any previous versions of the file. The double greater-than signs add lines to the existing batch file. The final line calls the newly created batch file.

If you substitute "real" settings for *path* and *prompt*, the batch file might look like this:

```
ECHO @ECHO OFF > SETPATH.BAT
ECHO PROMPT $P$G --G >> SETPATH.BAT
ECHO PATH=C:\;C:\DOS;C:\BATCH;
  C:\UTILS >> SETPATH.BAT
CALL SETPATH
```

With this program in hand, you're ready to disable AUTOEXEC.BAT and reboot. After CONFIG.SYS executes and the DOS prompt appears, activate PROMPT and PATH by typing SETPATH.

Daveed Shachar
Dimona, Israel

If you've upgraded to MS-DOS 6.2, you needn't disable your AUTOEXEC.BAT *to troubleshoot program conflicts. If you press F8 at bootup, DOS will prompt you before executing each line of your* CONFIG.SYS *and* AUTOEXEC.BAT *files.*

Also, if you store SETPATH.BAT *in a directory other than the default, you must supply the full directory name when calling the batch file. Until you call the* SETPATH.BAT *file and establish a path, DOS will*

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look for programs only in the current directory. —Eds.

Keep Your Start-Ups Clean

After installing new software, many users are horrified to learn that the application's installation program has modified their AUTOEXEC.BAT file. If you count yourself among those who don't like "outsiders" tinkering with your AUTOEXEC.BAT, you can protect yourself with a simple batch file. First, move the contents of your current AUTOEXEC.BAT to a batch file called STARTUP.BAT, or something similar. Then modify AUTOEXEC.BAT so that it contains just one line: the line that calls STARTUP.BAT.

After installing a new piece of software, look at AUTOEXEC.BAT to see whether anything was added. If you like what you see, add the new lines to STARTUP.BAT; otherwise delete them.

Daveed Shachar
Dimona, Israel

No Exit Codes Required

In "Keeping an ERRORLEVEL Head" ["Batch-File Medic," *DOS Resource Guide* #12, November 1993, page 46], Hardin Brothers discusses using XCOPY /M in an automated backup. He says that you must use XCOPY's exit codes to handle situations in which all files don't fit on one disk. That's not true.

You may back up the contents of an entire directory without running into problems, if you start by using this command to set the archive attribute of all files in the directory:

```
ATTRIB +A *.*
```

Then each time you fill up a floppy disk and insert another one to continue copying, type this line:

```
XCOPY *.* A:/M/S
```

XCOPY turns off the archive attribute as it copies files successfully. When you insert a new disk, XCOPY copies only files whose archive attributes are set.

Daveed Shachar
Dimona, Israel

When you use this technique, the files you copy end up without their archive attributes set. That's fine if that doesn't matter to you. But if you use your files' archive attributes to determine which files have been altered and therefore which you should back up, the only way to preserve the archive attribute and still be able to copy files to more than one floppy disk is to use XCOPY*'s exit codes. —Eds.*

A Helping Hand

If you're looking for information on Microsoft products, you may want to call two bulletin-board systems affiliated with the company. Operating out of Redmond, Washington, the Microsoft Download Service provides access to the Microsoft Electronic Technical Library, which contains sample programs, application notes, and device drivers, as well as programming aids and software updates for Windows, DOS, Word, Excel, and Basic, among others. It doesn't offer technical assistance, though.

The system's phone number is 206-936-6735; settings are 8 data bits, no parity, 1 stop bit (8-N-1).

Operating out of Beaverton, Oregon, the Central Point Software Online Support Center is devoted to the MS-DOS antivirus utility. You may reach the service at 503-531-8100. If you have a 2400-baud modem, call 503-690-6650; with a 9600-baud modem, call 503-690-4777. Communications settings are 8 data bits, no parity, 1 stop bit (8-N-1).

Recently, after running DOS's antivirus utility, I had difficulty booting my system. Today, I downloaded a text file from the Central Point BBS that explains how to fix the problem.

Robert J. Batterberry
Mt. Vernon, Wash.

The Microsoft Download Service is accessible from 5 a.m. to 1 a.m. Pacific time. It closes for four hours nightly so that the company can supply its Electronic Technical Library with the most up-to-date information possible.

Anyone with a 1200-baud, 2400-baud, or 9600-baud modem can access this service, which costs nothing more than the charge for the toll call. CompuServe members can also access it via CompuServe's Microsoft Forum. —Eds.

Finishing Touches

In "When a Simple Y/N Won't Do" ["Batch-File Medic," *DRG/DOS World* #13, January 1994, page 36], Hardin Brothers neglected the final cosmetic touch in his batch file for retrieving string input from the user.

In the GETPARM: section of KEYSGET.BAT, he uses ECHO to prompt the user to press F6 and press Enter. Instead, why not use ANSI.SYS to define a function key to carry out both actions? That way, the batch file could simply tell the user to press Enter.

Because this technique won't work if ANSI.SYS isn't loaded, the most elegant solution is to try resetting screen colors by echoing an ANSI.SYS escape sequence to the screen. You may then use DOS's CHOICE command to ask whether the user sees the colors and to employ the user's response to set an environment variable (perhaps named %ANSI%) to yes or no. Then any batch file can look at this variable to see whether ANSI.SYS is loaded; the result tells the batch file whether it can redefine keys, change screen colors, and so on.

One caveat: This technique doesn't work with all ANSI.SYS replacements. PKSFANSI and several other programs of that type let you change screen colors, but don't let you define keystrokes to carry out a particular action.

Frederick L. Sohn
New York, N.Y

DOS WORLD

Best of the Batch

Getting the Jump On Directories

If you're looking for a way to navigate quickly among directories—and without constantly issuing CD commands followed by pathnames—try the program presented here, GO.BAT. It lets you tag as many as five directories and then jump among them simply by typing `GO` and a tag name.

Working in an editor that saves files in ASCII (text) format, type in the listing as shown. Check your work to avoid introducing typos that might prevent the program from running. Then give the program a whirl.

To tag a directory, type a command such as this one:

```
GO TAG dirname tagname
```

where *dirname* is the name of the directory you want to tag and *tagname* is the environment variable you want to assign to the directory.

As written, the program accepts five variable names: HOME, WORK, ONE, TWO, and THREE. (You may substitute other variable names if you prefer.) To assign a directory called C:\PROGRAMS\BASIC\TEST to the tag WORK, for example, type this:

```
GO TAG C:\PROGRAMS\BASIC\TEST WORK
```

Before you begin jumping around, you must tag at least one other directory. For instance, if you tag a second directory and assign it the variable HOME, you may then move between the two directories by typing `GO HOME` and `GO WORK` at the DOS prompt.

As the accompanying "Syntax Summary" table (right) shows, GO.BAT accepts a number of other parameters, as well:

- MAKE lets you create and jump to a directory in one step. Typing `GO MAKE` *dirname*, for example, is equivalent to typing the following commands:

```
MD dirname
CD dirname
```

- SHOW lets you switch to and display the contents of a directory. Typing `GO SHOW` *dirname* is equivalent to typing this:

```
CD dirname
DIR
```

- UP lets you move up one level in a directory tree. Typing `GO UP` is equivalent to typing this:

```
CD..
```

- ROOT lets you jump to the root directory of the current drive, and typing `GO ROOT` is equivalent to this:

```
CD\
```

- CLEAR lets you "untag" directories. Because GO.BAT saves tags as environmental variables, you must type `GO CLEAR` to clear the DOS environment of variables created by GO.BAT. This is equivalent to typing the DOS command `SET` *tagname*`=` for each tag.

- ? and / let you display GO.BAT's on-line help screen, which outlines GO.BAT's command syntax, defines valid key words, and shows a few examples.

Behavior Modification

If you prefer to use your own tag names rather than those built into the batch file, you must replace the existing tag names in the "allowable tags" lines (middle of column 1, page 14), the %%1 and %%2 lines (middle of column 2, page 14), the IF %VARIABLE% lines (bottom half of column 1 and top half of column 2, page 15), and the SET lines (bottom half of column 2, page 15).

SYNTAX SUMMARY

To Do This:	Type This:
Tag a directory	GO TAG *dirname tagname*
Untag all tagged directories	GO CLEAR
Change to an existing directory	GO *dirname*
Change to a tagged directory	GO *tagname*
Change to a directory and list it	GO SHOW *dirname*
Go up one level in a directory tree	GO UP
Go to the root directory	GO ROOT
Create a directory and jump to it	GO MAKE *dirname*

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```
POPUP KEY CHR$ (1,41)
DO
 POPUP SLEEP USING EMS
 POPUP STUFF [illegible], 0, 0
LOOP
```

"... DOS (BASIC) developers would do better to look beyond Microsoft.™"
PC Magazine, *September, 1993.*

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You may also add or delete tags by adding new names or deleting existing names in these lines. When adding or changing tag names, always type them in uppercase letters. Also, don't use names you're already using as environmental variables (such as PATH, PROMPT, and so on). To list current environmental variables, type the command SET and press the Enter key. To increase the size of the DOS environment temporarily, type the following command before calling GO.BAT:

GO.BAT lets you jump quickly among as many as five tagged directories. As written, the program uses the DOS environment variables HOME, WORK, ONE, TWO, and THREE to store the names of tagged directories, but you may use other variable names if you prefer.

```
@ECHO OFF
GOTO start
----------------------------------
REM Name    : GO.BAT
REM By      : Mike DeAndrea
REM Created: 02-20-93
REM Revised: 04-25-94
REM Syntax : GO %1 %2 %3
REM          where:
REM          %1 is required and must be the
REM          'request for help'
REM          symbol, a key word, or a tag name.
REM              *The two help symbols are ?
REM               and \.
REM              *The allowable key words are:
REM                TAG   = To tag a directory.
REM                MAKE  = To create and jump
REM                        to a new directory.
REM                SHOW  = To jump to and display
REM                        the contents of
REM                        a directory.
REM                ROOT  = To move to the
REM                        root directory.
REM                UP    = To move up one level
REM                        in the directory
REM                        structure.
REM                CLEAR = To clear all tags.
REM              *The allowable tags are:
REM                WORK, HOME, ONE, TWO,
REM                and THREE.
REM
REM          %2 is required when parameter %1
REM          is TAG, MAKE, or SHOW.
REM          It is always a directory name.
REM
REM          %3 is required when parameter %1
REM          is TAG. It is always
REM          a tag name.
----------------------------------
:HELP
   CLS
   ECHO   GO is a navigational tool that lets you
     jump from directory
   ECHO   to directory, without typing CD
     and a pathname. Just
   ECHO   tag the directory with a tag name
     and then jump to that
   ECHO   directory by typing GO followed
     by the tag name. Suppose,
   ECHO   for example, that you tag two
     directories, one as WORK and
   ECHO   one as HOME. You then may jump from one
     to the other by
   ECHO   typing GO WORK and GO HOME.
   ECHO.
:SYNTAX
   ECHO Syntax: GO %%1 %%2 %%3, where:
   ECHO   %%1 is required and must be one
     of the following key words:
   ECHO      TAG   Use this key word to tag a directory.
   ECHO      MAKE  Use this key word to make
     a directory and go to it.
   ECHO      SHOW  Use this key word to go to
     a directory and list it.
   ECHO      ROOT  Use this key word to go to
     the root directory.
   ECHO      UP    Use this key word to move up one
     directory level.
   ECHO      CLEAR Use this key word to clear
     the tags you assigned.
   ECHO   %%1 may also be a valid tag name:
     ONE, TWO, THREE, HOME,
   ECHO   or WORK.
   ECHO.
   ECHO   %%2 is required only when %%1 = TAG,
     MAKE, or SHOW. It is
   ECHO   always a directory name, which may
     include a path.
   ECHO.
   ECHO   %%3 is required only when %%1 = TAG
     and is used to identify
   ECHO   the tag to be assigned to the directory
     given in %%2.
   ECHO.
   ECHO Examples:
   ECHO      GO TAG C:\BATCH\MYFILES HOME
   ECHO      GO HOME
   ECHO      GO WORK
   ECHO      GO MAKE C:\TESTDATA
   ECHO      GO SHOW C:\TESTDATA
   ECHO      GO ONE
GOTO END
:START MAIN
   REM See if %1 is a request for help.
     IF '%1'=='?' GOTO HELP
     IF '%1'=='/' GOTO HELP
   REM Make sure %1 was supplied; if not,
   REM print syntax message.
```

```
COMMAND /E:size
```

In place of *size*, specify the number of bytes you want to allocate. For example, this command creates a 2048-byte environment space:

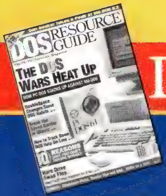
```
COMMAND /E:2048
```

When you finish working with the GO.BAT file, just type the word EXIT to remove the secondary command processor.

Mike DeAndrea
LaQuinta, Calif.

```
    IF '%1'=='' GOTO SYNTAX
  REM See what %1 is, and take
  REM the appropriate action.
  REM But first handle capitalization concerns.
    SET OLDPATH=%PATH%
    SET PATH=
    PATH=%1
    SET VARIABLE=%PATH%
    PATH=%OLDPATH%
    SET OLDPATH=
  REM If %1 is a key word, jump to the
  REM appropriate "subroutine."
    IF %VARIABLE% == TAG  GOTO TAG
    IF %VARIABLE% == MAKE GOTO MAKE
    IF %VARIABLE% == SHOW GOTO SHOW
    IF %VARIABLE% == ROOT GOTO ROOT
    IF %VARIABLE% == UP   GOTO UP
    IF %VARIABLE% == CLEAR GOTO CLEAR
  REM If %1 is a valid tag, change to the
  REM directory represented by
  REM the tag. But first assign a value to MATCH
  REM so that the IF
  REM statement can compare two strings
  REM (prevents syntax error).
    SET MATCH=N
    IF %VARIABLE% == ONE CD %ONE%
    IF %VARIABLE% == ONE SET MATCH=Y
    IF %VARIABLE% == TWO CD %TWO%
    IF %VARIABLE% == TWO SET MATCH=Y
    IF %VARIABLE% == THREE CD %THREE%
    IF %VARIABLE% == THREE SET MATCH=Y
    IF %VARIABLE% == HOME CD %HOME%
    IF %VARIABLE% == HOME SET MATCH=Y
    IF %VARIABLE% == WORK CD %WORK%
    IF %VARIABLE% == WORK SET MATCH=Y
    IF %MATCH% == Y GOTO END
  REM If %1 is neither a key word nor a tag,
  REM assume it's a
  REM directory and print assumption;
  REM then change to it.
    ECHO Assuming %VARIABLE% is a directory name.
    CD %VARIABLE%
    GOTO END
:TAG
     REM Also make sure %3 isn't null. If it is,
     REM print syntax.
       IF '%3'=='' GOTO SYNTAX
     REM See what %3 is, and go to the
     REM appropriate label.
  REM To see what %1 is, first handle
  REM capitalization concerns.
    SET OLDPATH=%PATH%
    SET PATH=
    PATH=%3
    SET VARIABLE=%PATH%
    PATH=%OLDPATH%
    SET OLDPATH=
  REM Now set one of the markers and change
  REM to that directory.
    IF %VARIABLE% == HOME SET HOME=%2
    IF %VARIABLE% == WORK SET WORK=%2
    IF %VARIABLE% == ONE  SET ONE=%2
    IF %VARIABLE% == TWO  SET TWO=%2
    IF %VARIABLE% == THREE SET THREE=%2
    CD %2
    GOTO END
:MAKE
     REM Make the directory and move to it.
       MD %2
       CD %2
       GOTO END
:SHOW
     REM Change to the directory and list it.
       CD %2
       DIR
       GOTO END
:ROOT
     REM Move to the root directory.
       CD \
       GOTO END
:UP
     REM Move up one level.
       CD..
       GOTO END
:CLEAR
     REM Clear environmental variables set
     REM by the user.
       SET HOME=
       SET WORK=
       SET ONE=
       SET TWO=
       SET THREE=
:END
     REM Clear the environmental variables
     REM set by the batch file.
       SET VARIABLE=
       SET VARIABLE=
       SET MATCH=
```

End



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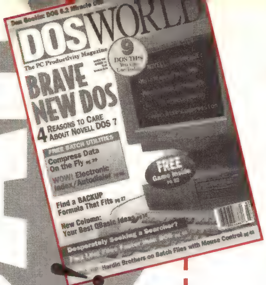
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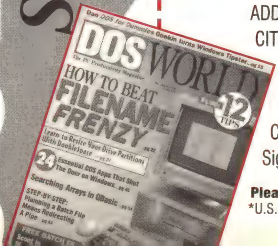
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GOOKIN ON DOS

The Seven Deadly DOS Commands

by Dan Gookin

A while back I wrote the famous "10 Worst DOS Commands" feature for this very magazine (*DOS Resource Guide* #5, September 1992, page 23; see the accompanying sidebar, page 18, for a summary). The reaction was mixed: Most people thought I didn't include enough; some thought I was unjust and hasty in my decisions. Oh, well—it's not my job to please everyone. Still, I think many people will agree on what I feel are the most dangerous DOS commands: those few commands that stand out as "for experts only" or "don't mess with these" in just about any DOS book. (They're listed in the second sidebar, page 19, in case you want a quick look.)

> *Like any tool, DOS can create or destroy, depending on how you use it.*

No matter what you label DOS and its commands, everything is basically a tool. And, like any tool, DOS can create or destroy, depending on how you use it. All the "most dangerous" commands really do have a purpose in life. It's only through their misuse that you can get into trouble, which is why most books and manuals advise against them. My purpose here is to tell you both how they're good and why they're sometimes bad, but please don't try any of these commands unless you have a solid reason to do so.

Night and the CTTY

The CTTY command is one of my pet peeves. It's something that could have been a lot better and often inspires DOS hackers with visions of hooking up a second keyboard and monitor to their computers. Alas, it's just not going to happen.

The only real command you can type (and don't try this) for CTTY is the following:

```
CTTY AUX
```

That tells DOS to use the serial port COM1 (also known as AUX) for input and output. If you have a second computer connected carefully to that port, you'll see the DOS prompt on that machine and can use DOS commands on it. You can't run any real programs, however, since they write directly to the PC's hardware and skip merrily over DOS for input and output. So this is just an exercise in hacking, which isn't very constructive and not really very dangerous—unless you type `CTTY AUX` with nothing connected to the COM1 port. In that case, you've locked up your computer but good.

Using CTTY AUX without anything connected to your COM1 port disables your keyboard permanently. After all, DOS is now expecting input from the AUX device, not the keyboard. And here's the upshot: Your only solution is to reset to regain control of the keyboard. Because of this problem, I dub CTTY one of the seven deadly DOS commands.

The DEL/ERASE Dilemma

The DEL (or ERASE) command is necessary, of course. In fact, I'd venture to say that most people would claim that I'm being unduly harsh about including it, especially in light of the UNDELETE command that comes with every version of DOS, from 5 hence. Alas, having UNDELETE is no excuse for being sloppy with DEL. I can cite half a dozen times I deleted a file and was completely unable to recover it using any disk utility.

Fortunately, this tale has a happy ending. It's very easy to make the DEL command more forgiving by using its optional /P switch. That directs DOS to prompt you yes-or-no for each file DEL is about to obliterate. It works like this:

```
C:\COMMAND.COM          Delete (Y/N)?
```

Press N! This works especially well with wildcard commands, such as DEL *.*. If you stick the /P on there, DOS will prompt you for every file to delete. It may slow you down, but you'll never have to regret losing something accidentally.

One way to force yourself into always using the /P switch is to create a DEL macro with DOSKEY. Here's the command:

```
DOSKEY DEL=DEL $* /P
```

This creates a DOSKEY macro named DEL (which is perfectly okay). The macro will retype the DEL command you type, tacking a /P onto everything. That way you'll guarantee the /P will always be there. This is a good command to add to your PC's AUTOEXEC.BAT file. (Refer to "10 Reasons to Load DOSKEY," by Ken Johnson, *DOS Resource Guide* #13, January 1994, page 26, for more information on DOSKEY and its macros.)

Fruit of the Poisonous DELTREE

The DELTREE command is the super DELETE command included with MS-DOS version 6.0 and later. It zaps a directory on your hard drive, all files in that directory, all subdirectories in that directory, and all their files as well. It's the software equivalent of a smart bomb, and it can have disastrous results if you misuse it.

Fortunately, Microsoft saw this stinker coming and included a warning every time you use it:

```
Delete directory "windows" and all
its subdirectories? [yn]
```

Type N and press Enter (even if you hate Windows)! In my travels I've used this command only three or four times maybe. It would be devastating on a beginner's computer, especially for someone who didn't understand the concept of subdirectories. What's worse is that it's next to impossible to recover files you delete from a subdirectory. This command can lead to a real mess.

As an alternative, I suggest using DEL and the RD commands. They're also in this list of the seven deadly DOS commands, but they force you to pay more attention to what you're doing. *Everyone* should avoid "one fell swoop" commands like DELTREE.

FASTOPEN Pulls a Fast One

This command has always been another of my pet peeves. While the idea of a disk cache is good, the documentation for FASTOPEN makes it sound as though your files will open so fast after it's installed that you'd think they came through the mail before. That may be true, but FASTOPEN doesn't pull through in the long haul—as either a disk cache or a fast file opener.

My main gripe with FASTOPEN is that it won't let you switch floppy disks. This is a common complaint: "My computer keeps asking me to insert the same disk over and over every time I change disks. I had to reset to get control."

That's FASTOPEN's floppy-disk "cache" in action. You can disable it, but my point is that other software does the job FASTOPEN is supposed to do, so why bother in the first place?

If you see the FASTOPEN command lurking in your PC's CONFIG.SYS or AUTOEXEC.BAT file, delete it at once! Use the SmartDrive disk cache instead. The latest version of SmartDrive (version 5.x) is actually, well, smart. It's set up in MS-DOS 6.2x whenever you run the MEMMAKER command, and having it means your disk drive will work that much faster.

The Finality of FDISK

The FDISK command is the most evil necessity in DOS's repertoire of deadly commands. It's a disk-configuration program, which you'll typically use once when you first install a brand-new hard drive. After that, using FDISK runs the risk of erasing your hard drive completely. Seriously, if everything is working fine and you're not installing a second hard drive, don't ever run this command.

I've written about FDISK a lot, and I've probably run it several more times than the average DOS user, primarily as research for my books on hard-disk management. Most recently, I used FDISK when I bought a second hard drive for my test computer. The hard drive's setup manual presented instructions on exactly what to do—and it really wasn't that hard. But had I been uninformed, bold, curious, or just stupid, I might

ORIGINAL TEN WORST COMMANDS

- APPEND
- CHCP/NLSFUNC/MODE etc. (code page commands)
- CTTY
- DISKCOMP
- EDLIN
- EXPAND
- FASTOPEN
- FC
- MODE
- RECOVER

have attempted the same thing on my first hard drive. The results would have been ugly.

Painful RECOVERy

The RECOVER command is a holdover from DOS's early, pre-hard-drive days, when users needed some sort of floppy-disk repair program. RECOVER scopes out bad disk sectors and obliterates them. It does the same thing on a hard drive—but with the added bonus of deleting all subdirectories. Honestly, I don't know of anyone who's benefitted from this misnamed utility.

Plenty of third-party hard-disk utilities can earnestly recover data from your hard drive. With MS-DOS 6.2x, the SCANDISK utility will try its best to reconstruct most of the rubble from a bombed-out hard drive. If SCANDISK can't do it, the disk is truly hopeless.

RD It and Weep

This is another one of the more controversial deadly DOS commands. The RD (or RMDIR) command is necessary for removing subdirectories. It's careful; you can't remove the directory unless it's completely empty of files and subdirectories. But it's not recoverable. Once you remove a directory, you can't get it back easily.

The only way I know to recover from a bad RD command is to restore from a recent backup. And while DOS's UNDELETE command won't find deleted directories, the UNDELETE command in Windows will. (Go figure.) So that tempers the deadliness of this command somewhat.

But my objection is that some users get zealous about using RD and strip out a lot of protected files manually from a directory just to get the satisfaction of having RD work. DOS protects files (makes them read-only or hidden) for a reason, and you shouldn't delete them carelessly. Also, major subdirectory removal is so rare that you should leave RD alone for the most part.

Seventh Heaven?

So there you have my seven deadly DOS commands. If you feel I've omitted anything, please write in and let me know what else you've found. And if you disagree with anything (and someone always does), write in and let me know that as well.

As DOS rides a slow boat into the sinking sun, I'm happy to say that most of its commands are beneficial and that after six releases Microsoft has added a lot of padding to ensure against mishaps. Let's hope this list will shrink some more as DOS matures into version 7.0. ■

Contributing Editor Dan Gookin is the author of numerous books on computing, including the best-selling DOS for Dummies *(IDG Books).*

THE SEVEN DEADLY DOS COMMANDS

CTTY
DEL/ERASE
DELTREE
FASTOPEN
FDISK
RECOVER
RD/RMDIR

DOS TIP

PUTTING ON THE DIGITAL BRAKES

Sometimes you need to stop DOS in its tracks. Maybe you've suddenly realized that something bad will happen if DOS carries out your command, or maybe a command's output has whizzed off screen before you had a chance to read it. The right solution depends on the problem at hand.

If you issue a command, such as `DEL *.*`, and realize your mistake *before* pressing Enter, you can use the backspace key, of course, to erase the command. But it's quicker to press Esc or Ctrl+C to cancel the command. If you've already pressed Enter, cancel the command by pressing Ctrl+C. You have to be quick, though, because DOS works fast.

When information scrolls by too fast the first time you issue a command, you may repeat the command by pressing F3 and Enter and pressing Ctrl+S or the Pause key (if you can find it) quickly to freeze the display temporarily. When you're ready to resume, press any key.

A more elegant solution is to press F3 and then type a space, pipe symbol (|), space, and `MORE`. This command invokes a DOS filter called MORE, which displays the first 23 lines of output and then pauses, prompting you to continue by pressing any key. A DIR command such as the following is probably the command most frequently associated with MORE:

```
DIR C:\DOS | MORE
```

But if your directory listings habitually scroll off screen too quickly, there's an even more elegant solution: adding a SET command to AUTOEXEC.BAT to tell DOS to display directory listings one page at a time. The command to accomplish this is as follows:

```
SET DIRCMD=DIR /P
```

To let up on the brakes and display an entire directory listing without pauses, type `DIR /-P`.

—Jack Nimersheim

READER FORUM

No Relief In Sight

by Hardin Brothers

Here in the mountains of New Mexico, late summers are usually pleasantly warm. But the last two weeks (I'm writing this column in August) have been stifling. The dogs spend their time lying in front of the swamp cooler. (Don't know "swamp cooler"? It's an ingenious and inexpensive substitute for an air conditioner—it evaporates water instead of boiling freon.) The rabbits and squirrels they usually chase now appear only at dawn and dusk; they, too, spend most of the day hiding from the heat.

I've been tempted to just hang out in my hammock, joining the dogs in their daily four-hour naps. But questions from far and wide—on topics as varied as blinking characters and benchmarking memory managers—are keeping me on my toes, looking up facts that I'm unsure of or chasing down the experts I often ask for advice.

> *I've been tempted to just hang out in my hammock, but questions from far and wide are keeping me on my toes.*

The Trouble with ANSI.SYS

Far south of the border, in Santa Maria, Brazil, Helio Harstein is struggling to display blinking characters within batch files.

Helio is using the PROMPT command and ANSI.SYS escape sequences, but finds he must create a sequence like the following to make the blinking characters appear:

```
@ECHO OFF
PROMPT $E[0;5;1m
ECHO ON

@ECHO OFF
ECHO This text blinks
```

Helio wants to know why he needs the blank line and whether I can suggest an easier way to produce blinking characters.

To answer those questions, I need to start at the beginning, with ANSI.SYS, a device driver that gives you control over your keyboard and screen. To take advantage of this program, you must include a DEVICE=ANSI.SYS command in your CONFIG.SYS file. You may then send commands to ANSI.SYS by "printing" unusual sequences of characters on screen. ANSI.SYS commands always start with an escape character—ASCII 27—followed by a left square bracket; they always end with a letter. Between the bracket and the letter, you place one or more numbers, separated by semicolons.

ANSI.SYS commands let you add colors to text, erase all or part of the screen, move the cursor around the screen, and redefine keys on the keyboard. DOS's on-line Help program includes a full list of the available commands.

The trickiest part of using ANSI.SYS commands is sending the escape character to the screen. If you simply press the Esc key, DOS interprets it as a signal to cancel the current line instead of as a code to print on screen.

One way to avoid this problem is by using the PROMPT command. PROMPT turns the string $E into the escape character, printing it every time the prompt appears on screen. In the example above, for instance, $E[signals the start of an ANSI.SYS command—the escape character and square bracket. The *m* at the end of the line tells ANSI.SYS that the command changes text colors. The sequence 0;5;1 first (with the zero) turns off any colors or other screen attributes that are on, then turns on blinking characters (the 5) and bold characters (the 1).

So far so good, but the PROMPT command merely notifies ANSI.SYS to get ready to make characters blink. Nothing happens yet. Then the next line turns on echoing, and as a result, the blank line is echoed to the screen. The subsequent line turns echoing off to prevent extraneous information (a batch-file command such as ECHO, for example) from appearing on screen. Finally, when the last ECHO command sends text to the screen, the message "This text blinks" is displayed in blinking characters.

Using PROMPT to issue ANSI.SYS commands is always a hassle. I recommend that you do it only when you want the commands to be part of every DOS prompt. For example, you might want a prompt that looks something like this:

```
PROMPT $E[0;37;44;1m$P$G > $E[0m
```

This turns on bright white characters on a blue background ($E[0;37;44;1m), displays the current drive and directory ($P$G) followed by a greater-than sign (>), and turns off the colored characters to wait for your input ($E[0m).

If you aren't creating commands that must be part of every DOS prompt, use the ECHO command, instead of PROMPT, to issue ANSI.SYS commands. With ECHO, you may telescope Helio's batch file into two lines:

```
@ECHO OFF
ECHO ←[0;5;1mThis text blinks
```

The only problem you'll encounter is inserting the escape character in the second ECHO command. If you're using the DOS editor, Edit, press Ctrl+P and then the Esc key to produce a left arrow. If you're using a different editor, consult its documentation for ways to include control codes in a document. If you use WordPerfect, for example, press Ctrl+V and Esc, then save the file in DOS format.

It's almost always easier to embed ANSI.SYS commands in ECHOs instead of PROMPT statements. Besides, if you use ECHO, you'll never lose your carefully crafted DOS prompt. And from the letters I see, it's clear that many of you spend hours devising and polishing your prompts. (If you're looking for other ways to brighten up your screen with ANSI.SYS, see "ANSI Magic: A Trick of the Eye," this issue, page 40.)

It Does Not Compute

From Italy by way of Boston, Massachusetts, Paolo Garzella asks whether memory managers slow down computers significantly. He sent a simple Basic program that runs an empty loop 1 million times and keeps track of the elapsed time. When he ran the program on a 66MHz 486 computer with Qualitas's 386Max present, the program took about 13 seconds. With DOS's HIMEM.SYS and EMM386.SYS, it needed at least 20 seconds. Without a memory manager, the loop executed in only 3 or 4 seconds.

In essence, his program loads a count into A, gets the current time, executes the loop FOR X = 1 TO A: NEXT X, gets the time again, calculates the amount of time elapsed, and then displays how long the loop took.

Unfortunately, it's impossible to use a simple Basic program to tell whether a memory manager slows down a program, and if so by how much. This is one task for which Basic, QBasic, and even QuickBasic are entirely unsuited. CPUs such as the 386, 486, and Pentium are so complex that you need a great deal of skill to write a meaningful benchmark program, and you'd have to pay attention to several factors that could affect the time required by your program.

First, you'd have to know whether the program is running in the CPU's real mode or V86 mode. In real mode, the CPU emulates the 8086; that is, your computer is restricted to being a fast IBM PC/XT computer. If you boot DOS with no memory managers, you're running in real mode.

V86 mode appears to be the same as real mode, because from a program's point of view, it has full control of an 8086 computer. But there's one important difference.

In V86 mode, several programs can run at the same time, each acting as though it has full control of an 8086 CPU. A supervisor program can switch

Want to Know More?

If you have a question, or need further help with something that has appeared in DW, write:

Reader Forum
DOS World
80 Elm St.
P.O. Box 802
Peterborough, NH 03458-0802

Please include a copy of your AUTOEXEC.BAT and CONFIG.SYS files on disk if you have particular problems with software or hardware conflicts and compatibility.

between one program and another, allocate memory for each, and perform other services.

Among its many powers, the supervisor has the ability to map the computer's physical memory so that any page can appear at any real-mode address for any program. When you load EMM386.SYS, 386Max, QEMM, or a similar memory manager, DOS applications run in V86 mode, with a supervisor working invisibly behind the scenes. The supervisor emulates an expanded-memory (EMS) card by remapping the computer's physical memory when necessary. Of course, the supervisor needs time to do its work, so your programs may run slightly more slowly. Usually, the difference is unnoticeable.

A second possible problem stems from the way memory managers affect the system clock. HIMEM.SYS, for example, has a switch called /CPUCLOCK. If you turn on this switch, the system clock is more accurate, but your programs may run more slowly. If you turn it off, the system clock may be inaccurate. Which way should you set HIMEM.SYS for your test program? Even if you add a section of code that catches the clock pulses, which occur about 18.2 times per second, you still won't know whether it's accurate, because a supervisor program could be stealing cycles and hiding the extra clock pulses from your program. If you want real accuracy, you need to time your program with an external clock, one that doesn't depend on the state of the computer.

A third potential inaccuracy may be introduced by the CPU's pipeline, memory cache, and any external memory cache added to the computer. The amount of time required to execute a CPU instruction depends, in large part, on the condition of the pipeline, on whether the instruction is in a cache or in standard RAM, and even on the amount of other cached data.

Also, the alignment of data in memory may affect timing significantly. The 8088 fetched only 1 byte of data at a time from RAM, so it made no difference where or how that data was stored. The 80286 can fetch data fastest if it's stored starting at an even address. A 2-byte data item stored at an odd address can take almost twice as long to load as the same item stored at an even address, because the CPU has to load 2 bytes of data at once. The 386 and 486 load data in 4-byte chunks, starting at an address divisible by 4; the Pentium reads 8-byte chunks of data. Unfortunately, most versions of Basic know nothing about data alignment, so timing may be randomly affected by the way the program and its variables are stored in memory.

Add to all this a degree of uncertainty over the order in which Basic lines are entered in memory; the way BASIC will handle the floating-point math in this simple benchmark (because X and A are real numbers, not integers); whether a multitasking environment is running and, if so, with what effect; and a dozen other factors, and you'll see that this short program doesn't test the computing environment fairly.

As CPUs and operating systems become more complex, benchmarks must also be more complex to measure anything meaningful. Today, almost the only way to test a computer system is to load, run, and time an application. The direct power of the CPU is only one part of the entire system. If you're working with drawings, you'll also be concerned with the speed of the video board and video drivers. If you use database programs, the disk speed and disk cache may be more important than CPU speed. The math coprocessor and video system are important to spreadsheet users who draw graphs and charts.

So, to answer Paolo's question, yes, a memory manager can slow down the computer. Yes, you can fine-tune a memory manager with its various options. But, no, you can't say—at least on the basis of his short program—that 386Max slows down the computer by a factor of three and that HIMEM.SYS and EMM386.SYS slow down the computer by a factor of five. That's not a fair judgment unless you do a great deal more testing.

Chucking CHKDSK

Another thorny DOS problem comes to us from William H. Young, Jr., who provides PC and local-area network support for 150 computer users in an office building in Miami, Florida. He reports that his clients are using DOS's CHKDSK /F to repair data and that rebuilding files from the lost clusters CHKDSK collects is quite cumbersome. They examine the FILE*nnnn*.CHK files, try to guess to which files the lost clusters belong, and then attempt to relink them. "Is there a better way to check and repair files?" William asks.

I agree that rebuilding files after using CHKDSK /F is an exercise in

DOS TIP

ON YOUR MARK

If you use DOS's full-screen editor, EDIT.COM, to work on long files, you may appreciate its four built-in "bookmarks." To insert a bookmark, place the cursor at the location you want to mark; then press Ctrl+K and type 0, 1, 2, or 3. To return to the marked location, press Ctrl+Q followed by the correct number. Unfortunately, however, EDIT's bookmarks are valid only for the current computing session. When you save a file to disk, EDIT doesn't maintain the bookmarks you've inserted.

—Jack Nimersheim

frustration. That's part of the reason I never use it—it's about as useful for repairing disks as a sledgehammer is for making fine furniture.

The problem is that CHKDSK is both slow and dimwitted. Without the /F ("Fix-It") option, CHKDSK will tell you there's a problem if it encounters one it recognizes—but it won't tell you where that problem lies, which files are in jeopardy, or what you should do to try to fix it. And once you use CHKDSK /F, you can't undo any of the changes it makes to your hard-disk drive.

You'll find many better disk-checking and repair utilities on the market. I use The Norton Disk Doctor, part of The Norton Utilities 8.0 from Symantec Corp. ($179; 800-441-7234 or 408-253-9600), once a day to make sure my hard disks and files stay in good shape. It provides as much information as possible whenever it locates an error and can create an UNDO file in case you find that the cure is worse than the ailment.

Still, if your clients have to use CHKDSK /F or any other disk-repair program often, there's a deeper and more serious problem at work. Are they exiting back to the DOS prompt before they turn off or reboot their computers? If not, files tend to get mangled, especially if they use disk-caching software with lazy or delayed writes. Do they perform occasional surface scans of their hard disks to make sure they aren't about to suffer a major hardware calamity? Are they using in-house software that needs some debugging?

I use my computers daily and run hundreds of programs over the course of a year. I'm constantly adding and deleting files, and yet I rarely find any lost clusters or cross-linked files. About twice a year, CHKDSK or The Norton Disk Doctor reports a problem on my computers. If your computers are giving you frequent errors, you need to find and correct the real cause of those problems.

How Big Is My System's Buffer?

Do you know what goes on under the hood of your computer? Rick Denning of Great Neck, New York, has a pretty good idea and wants to do something about it. He wants to know whether he can increase the size of the keyboard buffer without using a memory-resident (TSR) program. Are there unused blocks of memory he may use or perhaps blocks he may overwrite?

When you press or release a key in DOS or a DOS application, the keyboard interrupts the CPU and demands attention. A short program in your computer's BIOS gets control of the computer, reads the key you pressed, and stores the key in a buffer in memory. If you press or release a shift key, such as Shift, Ctrl, Caps Lock, Num Lock, and so on, the information is stored in a key-state table instead of the buffer.

When DOS or an application is ready for a keystroke, it asks another short BIOS program to look into the buffer and see whether a key is waiting. If so, the BIOS routine retrieves the key from the buffer and gives it to the program that requested it.

The keyboard buffer isn't at all mysterious. It's simply 32 bytes of low memory, enough for 15 keys. The buffer is organized in a circle: When the last storage space is used, the BIOS starts storing keystrokes at the beginning of the buffer. Four bytes of low memory keep track of the first and last keystrokes in the buffer; four more keep track of the location of the buffer.

If you type faster than DOS or an application can use your keystrokes (or if you type during slow activities such as disk or printer access), the 15 spaces in the keyboard buffer fill up. If you type more keystrokes, the computer beeps and ignores those keystrokes.

If you program in assembly language or C, it's relatively easy to write a program that mimics the BIOS and stores keystrokes somewhere else in memory. That will give you a larger keyboard buffer, one that won't overflow.

Your program must be a TSR, though, because it has to continue running while DOS and other applications do their thing. And if it's a TSR, it will use either conventional or upper memory, both of which are scarce on many computers.

So, Rick is asking a sensible question. Does free space exist in low memory, a space he might use as a keyboard buffer and that's longer than the 32 bytes the buffer normally uses? If so, it should be easy to write a short Debug script that would make use of the new, larger space.

I know of only one candidate for the task, a 64-byte area of low memory that's marked as reserved in the documentation I have available. But a quick examination of this area with Debug shows that the BIOS uses it, probably as a stack or work area. Also, because neither I nor some of the experts I've asked have ever heard of a block of free low memory, we assume none exists. If it did, somebody would have claimed it and used it long ago.

In the days of the original PC, which used an 8088 CPU running at 4.77MHz, fast typists frequently filled up the buffer more quickly than the system could empty it. With today's much faster CPUs, you're less likely to need additional keyboard buffer space. But if you do, you can turn to the numerous shareware, freeware, and even commercial programs that will provide more buffer space. Each must be resident in memory to do its work, but most are so small they shouldn't put undue strain on your allotment of upper or conventional memory. ■

Technical Editor Hardin Brothers has been working with computers and writing about them for 15 years.

THE RIGHT COMMAND

Put an End to Copy Confusion

You can pick from COPY, XCOPY, REPLACE, and DOS 6.x's MOVE to copy files—but which command is right for the job?

by Ken Johnson

You're probably familiar with DOS's COPY, XCOPY, REPLACE, and MOVE commands. Chances are, you're most comfortable with COPY, and perhaps XCOPY, too. REPLACE is a little less popular; so too is the long-awaited MOVE command, which made its début only recently in MS-DOS 6.0.

All these commands do similar things within DOS—that is, they copy files from one location to another. But therein lies the confusion. Why are there so many variations (particularly COPY and XCOPY)? Does one type of command replace another? Are they really interchangeable, or are there benefits in using one over another? If so, what are they?

As you might expect, COPY, XCOPY, REPLACE, and MOVE aren't clones of one another. Each command has its own particular strengths and can be used to your best advantage in certain situations.

Unfortunately, Microsoft has never made those advantages clear, beginning as far back as DOS 3.2, when it introduced XCOPY and REPLACE. So let's try to make some sense of them here.

Copying for Safety's Sake

Elaine would rather be safe than sorry, so she makes a habit of copying important files from her PC's hard drive to floppy disks. For basic copying, Elaine can choose between COPY and XCOPY. But it's to her advantage to use XCOPY.

First, XCOPY is much faster for copying a large file or a group of files, though COPY is always loaded in memory, because it's an internal DOS command.

COPY reads and writes only 64K of one file at a time, so a 200K file, for example, would require four disk reads and writes. XCOPY, on the other hand, reads as many of the source files as it can fit into conventional memory, then writes them all at once.

Elaine likes to copy files to floppy disks for backup purposes at the end of the day, and XCOPY can help her select which files to copy. COPY (and MOVE) can select files based on filename only, but XCOPY can pick files based on date and on whether the file has been changed.

XCOPY's /D:DATE switch lets you copy only files with a date greater than or equal to the date specified. The default date format is *mm-dd-yy*. So Elaine can do an XCOPY each evening, using *.* as the file specification and /D with today's date, and the command will ensure that all files created or modified today are copied to floppy disk.

Elaine sometimes wants to copy all files she's changed, no matter the date—and XCOPY can help here, too. When a file is modified, DOS turns on its archive attribute, and XCOPY can use that to select files. With the /A switch, only those files with archive attributes set to *on* are included in the copy. The /M switch copies only those files with the archive attribute on, but that attribute is turned off after the copy is completed. (You can use either /A or /M, but not both.)

Ken Johnson is training and support manager at the law firm of Mayer, Brown & Platt in Chicago, and a director of the Chicago Computer Society. A columnist and writer for several legal computer publications, he's also a contributing editor for Hard-Copy, *the journal of the Chicago Computer Society.*

For example, Elaine can use this command to copy all her DOC files to the disk in the A: drive:

```
XCOPY C:\*.DOC A:\ /S /M
```

This XCOPY copies all modified DOC files from all directories on the C: drive to directories of the same name on the A: drive. Since the source starts at the root directory and the /S subdirectory switch is given, XCOPY will search through the entire C: drive for files with the DOC extension. It turns off the archive attribute after it copies each file.

XCOPY, like the other commands, will stop when the target disk runs out of space. That means that some of Elaine's DOC files may not be copied to the disk in A:. If that's the case, Elaine can simply insert a new disk and repeat the command. Since the archive attributes of the previously copied files are turned off, they won't be included in this next execution of XCOPY.

Elaine can set up a simple batch file that will copy all modified files to the A: drive, which she can then run when needed. You can easily automate an XCOPY "incremental backup" like this in a batch file, since XCOPY will return an errorlevel of 4 when the disk runs out of space. The batch file can check for that in an IF statement, tell Elaine to insert a new disk, then loop back to reexecute the XCOPY command. Here is Elaine's COPYMOD batch file:

```
@ECHO OFF
REM COPYMOD.BAT-XCOPY
  backup batch file
ECHO-XCOPY INCREMENTAL BACKUP
  OF C: DRIVE TO A: -
:LOOP
ECHO Insert blank, formatted disk
  in A: drive
PAUSE
XCOPY C:\*.* A: /S /M
IF ERRORLEVEL 4 GOTO LOOP
ECHO All Done
```

Let's keep a couple of points in mind. XCOPY won't copy hidden or system files—those with their hidden or system attributes turned on. (The *DOS 5 User's Guide* states that the XCOPY command in previous versions of DOS could copy hidden and system files, but this is *not* correct.) And of course, XCOPY can't copy a file that is larger than the disk to which you are copying.

Copying to Get Organized

Jerry has another copy need. He's just inherited a new computer at work that requires some major disk housekeeping. He needs to move some files to different directories, and he also wants to rename some directories. On top of that, Jerry also needs to load several disks' worth of files from his old computer onto this system. Jerry's best tools are MOVE to move files and rename subdirectories and XCOPY to transfer files from disk to his new PC's hard drive.

MOVE, introduced in MS-DOS 6.0, finally lets you move files from one directory to another. MOVE is

XCOPY AS A DISKCOPY ALTERNATIVE

Because XCOPY can copy subdirectories as well as files, it's often considered an alternative to DISKCOPY for disks of different sizes or densities. DISKCOPY works only on disks of the same size (for instance, you can't DISKCOPY a 5.25-inch disk to a 3.5-inch disk) and works reliably only on drives of the same density. Because XCOPY doesn't make a track-by-track duplication, you can use it to copy disks of different sizes and densities. The following command duplicates the files and directories from the disk in drive A to the disk in B:

```
XCOPY A:\*.* B: /S /E
```

When choosing whether to use DISKCOPY or XCOPY to duplicate disks, consider the following points:

- DISKCOPY works only on disks of the same size, and best on disks of the same density. You can use XCOPY on disks of different sizes and densities.
- DISKCOPY can format the target disk if necessary, and formats to the same size as the source disk. The target disk must already be formatted for XCOPY.
- Since DISKCOPY makes an exact duplicate of the source disk, it fails if it encounters any bad sectors on the target disk; XCOPY ignores the bad sectors.
- DISKCOPY overwrites any existing files on the target disk. XCOPY simply adds to the files already there. Start with an empty target disk when using XCOPY.
- Since it duplicates the organization of the source disk, DISKCOPY perpetuates file fragmentation. XCOPY copies files in contiguous sections, and thus "defragments" them on the target disk. This is another reason to start with a blank floppy as the target—if there are files already on the disk, XCOPY may fragment the copied files to make them fit.
- Since DISKCOPY makes a duplicate of the disk, it copies hidden and system files and the volume label to the target disk. XCOPY doesn't copy hidden or system files or the volume label.
- Although you can use DOS's ATTRIB command to turn off files' hidden and system attributes so that XCOPY will include them, it's not recommended for system files (which must often be in a specific physical location on the disk).

—K.J.

unique among the DOS commands discussed here in that you can execute it once for files with different names and in different directories. It accepts a list of files to move, with names separated by commas; the last entry on the command line designates the files' destination.

On his new computer, Jerry has found batch files in several places: in the DOS subdirectory, in a \BIN and a \BAT directory, and in the root directory. In addition, he's been keeping some of his own batch files on a disk in the A: drive. He wants to move all these batch files into the C:\UTIL subdirectory. MOVE can do this in one command:

```
MOVE C:\*.BAT, C:\BIN\*.BAT,
   C:\BAT\*.BAT, A:\*.BAT C:\UTIL
```

(Of course, Jerry notices that this will also move his AUTOEXEC.BAT file, which must be in the root directory. So he just moves that one file from C:\UTIL back to the root.)

Jerry can also use DOS's MOVE command to rename (but not move) subdirectories. Jerry simply specifies the old directory name as the "file" to move, and the new directory name as the file's destination. Using MOVE to rename subdirectories has some limitations: You can't rename the current directory, and the new directory name can't duplicate the name of a file or a subdirectory of the parent directory. Jerry also can't change the parent directory of the directory he's renaming—that would be a move, of course!

To get files from his old PC into his new computer via floppy disk, Jerry uses the XCOPY command with its /S switch (copying to and from the floppy). XCOPY's /S switch will copy child subdirectories and their files from the source directory to same-named subdirectories in the target directory. If they don't already exist, the command will create the target subdirectories.

So that's another advantage of using XCOPY over COPY or MOVE: It can create subdirectories on the fly. (For more about XCOPY and subdirectories, see the accompanying sidebar "XCOPY as a DISKCOPY Alternative," page 25.)

Since Jerry wants to duplicate all of the source directory's subdirectories on the target directory, even if no files are copied to some of those subdirectories, he uses the /E switch with /S. /E will copy empty subdirectories to the target.

Jerry needs to be sure to transfer his C:\JERRY directory and all its files and subdirectories to his new PC. First he copies them to the floppy disk:

```
XCOPY C:\JERRY\*.* A: /S /E
```

Then he copies them to his new computer:

```
XCOPY A:\*.* C:\JERRY /S /E
```

A COPY/XCOPY PRIMER

1. When should I use COPY and XCOPY?

Use COPY or XCOPY whenever you want to copy files to a different disk or directory, or when you want to make copies of files in the same directory with different names.

2. Can I COPY files from different directories to a new directory?

With COPY, no. With XCOPY you can include files from subdirectories. XCOPY's /S switch copies child subdirectories and their files from the source directory to the same subdirectories in the target directory. It creates those target subdirectories if necessary.

3. Can I rename files when I COPY them to a new directory?

COPY and XCOPY let you copy and rename files when you specify the new name on the command line. Both commands can also use DOS wildcard characters to copy and rename multiple files. Wildcards in the source-file specification mean "copy all matching files"; wildcards in the target-file specification mean "use the same name as the source."

4. Can DOS warn me before copying a file and overwriting an existing file in the new directory?

Yes, if you've upgraded to MS-DOS 6.2. XCOPY and COPY by default now prompt you to confirm the overwrite of an existing file. In a batch file, however, they act the way they did in previous DOS versions; in other words, they overwrite without warning. If you want to force XCOPY and COPY to always prompt you, add the command SET COPYCMD=/–Y to your AUTOEXEC.BAT file.

5. Can I select files to copy on anything other than the filename?

XCOPY includes several switches to do just that. /D:date lets you copy only those files with a date greater than or equal to that specified. The format of the date depends on DOS's country code; for the United States (the default setting), the format is *mm-dd-yy*. With the /A switch, only those files with archive attributes (modified files) are included in the copy. /M copies only those files with their archive attributes switched on, but it turns them off after it completes the copy.

6. How do I decide whether to use COPY or XCOPY?

COPY is faster for copying one small file because as an internal command, it's always in memory. (XCOPY is an EXE program, which must be loaded into memory when executed.) COPY copies only 64K of one file at a time, however. XCOPY is faster for large or multiple files, since it uses all available conventional memory to perform the copy. Also use XCOPY if you want to include subdirectories in the copy, if you want to copy by date, or if you want to copy only modified files.

—K.J.

A MOVE PRIMER

1. When should I use MOVE?

Use MOVE when you want to move files physically to a different disk or directory, or to rename a single file. You can also use MOVE to rename, but not move, directories.

2. Can I MOVE files from different directories to a new directory?

Yes—simply give the names of the files to move, separated by commas. (Include the path if not in the current directory.) Whenever you use multiple filenames with MOVE, the last entry on the command line is the location to which the files will be moved.

3. Can I rename files when I MOVE them to a new directory?

MOVE lets you rename only a single file when moving it, by including the new filename in the destination. You can't rename multiple files when moving them.

4. Can DOS warn me before moving a file and overwriting an existing file in the new directory?

Not if you still use MS-DOS 6.0. If you've upgraded to MS-DOS 6.2, MOVE by default prompts you to confirm the overwrite of an existing file. In a batch file, however, MOVE will behave as in MS-DOS 6.0—it overwrites without warning. If you want to force MOVE to always prompt you, add the command SET COPYCMD=/–Y to your AUTOEXEC.BAT file.

5. Can I select files to move on anything other than the filename?

No, MOVE will accept only file specifications that select which files to include in the MOVE. If you want to MOVE files based on date or archive attribute, use XCOPY with its /D, /A, and /M switches, then delete the original files.

—K.J.

Copying for Consistency

George has still another copy dilemma. He often takes files home from the office in the evenings and on weekends, so he needs to keep all these files in sync—on his home and work computer, and on the disk he uses to transfer the files. His biggest nightmare is that he'll copy an old version of a file over a newer version, wiping out hours of hard work.

The REPLACE command is just what George needs. Its strength lies in replacing or adding files from one directory to another. It includes two switches George will find helpful: /U and /A. /U updates existing files, and /A adds new files.

REPLACE's /U switch makes sure that George won't overwrite a more recent version of a file. It makes REPLACE examine the date and time stamps of the matching source and target files, and replace only those target files that are older than their source files.

COPY, XCOPY, and MOVE have no way of copying only new (nonexisting) files, but REPLACE can do it with the /A switch. /A will copy only those files from the source that don't already exist in the target directory—in effect, changing the sense of REPLACE to "copy if not already there." (By the way, you can't use the /A switch with /U or with REPLACE's /S subdirectory switch.) Using these two switches, there's no chance George will copy over an old version of a file or "clobber" a file by copying a different file of the same name.

George can automate his task with DOSKEY macros. Here are two macros for his computer at work:

```
DOSKEY FROMHOME=REPLACE A:\$1 $2
  /U $T REPLACE A:$1 $2 /A
DOSKEY TOHOME=REPLACE $1 A: /U $T
  REPLACE $1 A: /A
```

FROMHOME copies files from a floppy disk in the A: drive to George's office computer. He gives the file specification in $1 and the target directory for the floppy-disk files in $2. (If nothing is specified for $2, the command uses the default directory.) The first REPLACE copies up-

DOS TIP

THE PAUSE THAT ILLUMINATES

I often use Debug to convert assembly-language script (SCR) files from ASCII format to COM format. Unfortunately, I sometimes make mistakes, and it can be hard to track down the source of the problem if the listing is long. This simple trick makes the task easier.

When you invoke Debug to create the COM file, add a pipe symbol (|) and MORE to the end of the line. For example, if you're trying to create RUN.COM from RUN.SCR, use this command:

```
DEBUG < RUN.SCR | MORE
```

As it creates RUN.COM, Debug not only writes to disk, but also sends information to the screen. When you use the MORE filter, DOS displays the first page of information on screen and then pauses until you press a key.

This should give you the time you need to figure out what's going wrong. If not, perhaps a printout will help. To produce one, use this command instead:

```
DEBUG < RUN.SCR > PRN
```

—Cal Callender

dated files from A:, and the second copies new files from A:. $T separates two commands.

TOHOME goes the other way—it copies files from George's office PC to the floppy disk in the A: drive. The files to copy are given in $1; he needs to include the full path if those files aren't in the current directory. Since George is always copying the files to the A: drive, there's no $2 target parameter. Again, the first REPLACE copies updated files, and the second copies new files.

Similarly, George can set up two macros at home (say, FROMWORK and TOWORK) to handle copying files from floppy disk to his home computer. For even better safety, George can include REPLACE's /P switch with /U so that DOS will always prompt him before overwriting an existing file. Now he'll never have to worry about not having current files both at work and at home.

A REPLACE PRIMER

1. When should I use REPLACE?

Use REPLACE primarily to update files with new versions of the same files, or to copy files that don't already exist in the target directory.

2. Can I REPLACE files from different directories to a new directory?

No, all source files for the REPLACE command must be in the same directory. REPLACE can replace a file in a directory and its subdirectories with the /S switch, however. By starting at the root directory and using /S, you can REPLACE a file anywhere on your hard disk.

3. Can I rename files when I REPLACE them?

No, since that wouldn't be replacing the current files. Use the COPY or XCOPY command instead.

4. Can DOS warn me before replacing an existing file?

Yes—use REPLACE with the /P switch. DOS will show you the filename and ask whether you want to replace it.

5. Can I select files to replace on anything other than the filename?

Yes, with the /U and /A switches. /U lets you update only existing files with newer versions of those files. The /A switch copies from the source only those files that don't already exist in the target directory. You can't use /A with either /U or /S.

—K.J.

A Copy Command For Every Situation

As you can see, each of the COPY, XCOPY, REPLACE, and MOVE commands has its own strengths and can be used to your benefit in different situations. That's one of DOS's big advantages: flexibility that translates into convenience, efficiency, and ease of use on a day-to-day basis. Elaine, Jerry, and George have all found the particular commands most helpful to them in sync with the way they work.

To find the right commands for your situation, look at your needs in copying and moving files and follow these general guidelines:

- Use COPY to copy a single small (less than 64K) file, but XCOPY for larger files or groups of files.
- Use XCOPY and its switches when you want to copy by date or archive attribute, or to copy to and from subdirectories.
- Use MOVE when you need to move files to another directory, or when you want to rename a subdirectory.
- Use REPLACE when you want to update existing files with newer versions, or when you need to add new files to a directory.

With a little understanding of these different commands, copy confusion should be as rare as a year without an announcement of still another update of your favorite software package! ■

DOS TIP

PERFECT TIMING

Did you know that you can often tell to which version of a program a particular file belongs by taking a directory and examining the time listed in the file's directory entry? For instance, the files installed by MS-DOS 6.2 carry a time of 6:20 A.M., files from The Norton Utilities 7.0 all show times of 7:00 A.M., and those for PKZIP 2.04G list 2:04 A.M. in the time column.

Programs that follow this convention let you glance through a directory display after a software upgrade and pick out which files were replaced by newer versions. If you look through your C:\DOS directory after upgrading to DOS 6.2, for example, you'll notice that the files for the DOS Shell were untouched. (Their times are listed as 6:00 A.M.) Of course, you may also deduce this by looking at the files' dates. But because it can be hard to remember exactly when a new version of a program came out, I find it easier to refer to files' times.

Among the vendors and programs that use this time scheme are Microsoft (DOS, Windows, mouse driver), Symantec (The Norton Utilities, Norton Desktop for Windows), PKWare (PKZIP), Quarterdeck Office Systems (QEMM), CompuServe (CompuServe Navigator for Windows), and Traveling Software (LapLink Pro).

—Jeff DeTray

PC TOOLBOX

A Batch Of Windows

You'll be the Bob Vila of batch files when you add some snappy new windows to your tired old programs.

by Robert L. Hummel

Despite my loyalty to DOS, I have to admit that certain aspects of that venerable operating system are simply inexcusable. Foremost among DOS's failings are its primitive video-display routines. DOS offers one elementary routine with which a program can write characters to the display—one at a time. Or you can use another function to display any string that doesn't contain the $ character. In many ways, these functions are the computer equivalent of scratching characters in the dirt with a blunt stick.

Today's super-VGA systems are breathtaking—yet DOS still refuses to let you display characters in color. DOS also falls short in other video abilities. You can't read characters (or colors) off the screen, for example. You can't move the cursor to different locations. You can't retrieve any information about the display format itself. And you definitely can't do it from a batch program.

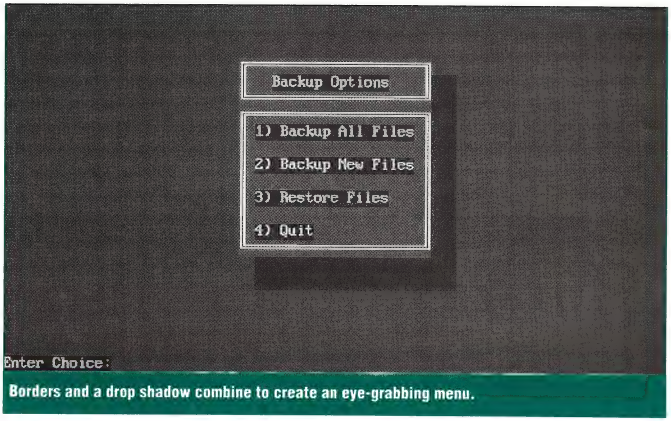
Contributing Editor Robert L. Hummel is the author of PC Magazine's Programmer's Technical Reference: The Processor and Coprocessor *and* PC Magazine Assembly Language Lab Notes *(both from Ziff-Davis Press).*

What's missing from DOS, and from its batch program language, are some simple tools for display manipulation.

We constructed two of these tools in *DRG/DOS World* #17's "PC Toolbox" ("Put Some Life into Your Batch Files," September 1994, page 30): the GOTOROW utility, which positions your cursor within any row on screen, and the SAYAT utility, which positions the cursor and then displays a line of text. In this column, I'll present two utilities that'll add real pizzazz to your displays.

Window Dressing

Nearly all popular application programs have one characteristic in common: windows. Note that I'm using the word *windows* with a lowercase *w*. A window is simply an area of the screen set off by a border, a contrasting color, or both. Use windows, borders, and color artfully, and you can dress up an otherwise dull program, focus the user's



Borders and a drop shadow combine to create an eye-grabbing menu.

attention where it needs to be, and give your programs a professional appearance. The attractive menu in the accompanying screen shot (page 29) shows a good example of what I mean.

Until now, if you wanted to use color and create fancy screens, you had to learn a programming language such as Basic or Pascal. Taking the time to master a new language may be more effort than you want to invest. And writing a Basic program to coordinate a few tasks may be overkill. In many cases, all you want to do is dress up an existing batch program. Don't worry—you can do it. That opening screen shot, in fact, was produced by a batch program using the utilities presented in this column.

Color My World

The first utility we'll use to create our screen designs is WINAT. (To convert the Debug script WINAT.SCR, right, to the executable program WINAT.COM, see the "Debug Scripts" section in "How to Use This Magazine," this issue, page 78.)

Like a coat of primer on your walls, WINAT lays the groundwork on which you'll build the rest of your display by creating a rectangular window at a designated spot on screen.

In addition to the window's size, you specify both a background and a foreground color for any text written in the window. To create a

WINAT.SCR creates the WINAT.COM program, which paints windows on your PC's display.

```
N WINAT.COM
A 100
MOV   SI,81
CALL  13B
DEC   AH
MOV   CH,AH
CALL  13B
DEC   AH
MOV   CL,AH
CALL  13B
DEC   AH
MOV   DH,AH
ADD   DH,CH
CALL  13B
DEC   AH
MOV   DL,AH
ADD   DL,CL
CALL  13B
MOV   BH,AH
CALL  13B
SHL   AH,1
SHL   AH,1
SHL   AH,1
SHL   AH,1
OR    BH,AH
MOV   AX,600
INT   10
RET
MOV   AX,2901
MOV   DI,5C
INT   21
PUSH  SI
MOV   SI,5D
SUB   AX,AX
LODSB
CMP   AL,20
JZ    156
SUB   AL,30
AAD
MOV   AH,AL
JMP   149
POP   SI
RET

RCX
58
W
Q
```

End

DOS TIP

MAXIMIZING MEMORY WITH MEMMAKER

In many senses, using MemMaker to optimize your system's memory is a "no brainer": You run the program, choose the Express or Custom setup option, and the program presents you with your choices, issuing explanatory messages as it goes. Using your responses to guide its actions, the program then optimizes memory use automatically. But to ensure that MemMaker's optimal memory configuration is really your system's optimal configuration, you may need to make an adjustment or two.

First, before you even think of running MemMaker, check your AUTOEXEC.BAT file for CALL commands that connect to batch files that in turn load memory-resident programs (TSRs). Find another way to load such programs, because MemMaker ignores CALL commands. If you use CALL to load numerous TSRs, MemMaker won't free up the maximum amount of conventional RAM available on your system.

Second, if you're one of the many DOS users who hasn't taken to Windows, use the following command to call MemMaker and set the number of Windows translation buffers to zero:

```
MEMMAKER /W:0,0
```

By default, MemMaker sets aside two 12K regions in upper memory for Windows translations buffers. If you don't run Windows, you don't need to reserve this space.

Conversely, if you work exclusively in the Windows environment—even running all your DOS programs from within Windows and never calling external DOS programs, such as FORMAT.EXE and MSBACKUP.EXE, from the DOS prompt—choose Windows' Custom setup option. If you then answer yes to MemMaker's "Optimize upper memory for use with Windows?" query, Windows and DOS programs running under Windows will have more conventional memory in which to operate. (Programs you run at the DOS prompt will have less memory available.)

Finally, remember that the adjustments MemMaker makes to CONFIG.SYS and AUTOEXEC.BAT files are based on the contents of those files at the time. If you're like most people, you'll modify your start-up files occasionally. When you add or delete a piece of PC hardware that requires a device-driver program—a mouse, a hard drive, a CD-ROM drive—it's a good idea to run MemMaker again to reoptimize memory use.

—Jack Nimersheim

window on screen, simply use the following command:

```
WINAT row col nrow ncol
  foreground background
```

Here, *row* represents the number of the uppermost row of the window. The top row on your display is always row 1; row numbers increase as you move down the screen. On DOS's default 80-by-25 text display, the bottom row will be row 25. If you've set your screen to use 43 or 50 rows, however, WINAT will also accept row values up to those limits.

Similarly, *col* represents the leftmost column of the window. The first column on your display is column 1; on a typical screen, the rightmost column is column 80. The two parameters *nrow* and *ncol* specify the number of rows and columns, respectively, in the window.

The foreground and background parameters determine the color of the window and the text that will appear in it. The first of the accompanying tables ("The DOS Spectrum," page 33), lists the colors available. You can choose any of the 16 possible values, from zero through 15, for the foreground color. For the background, only zero through 7 are valid. If you specify a background hue of 8 through 15, the colors will be the same as if you'd chosen zero through 7, but the foreground text will blink.

To keep WINAT's size to a minimum, I've had to eschew luxuries such as error checking. If you pass arguments with illegal values or too few arguments to WINAT, the results are unpredictable. You won't hurt anything, but you could wind up with a strange-looking screen. In most cases, executing the CLS command will clear things up.

As an example, let's create a 10-row-by-20-column window in the center of the screen and give it bright white text on a red background. At the DOS prompt, type the following command:

```
WINAT 12 30 10 20 15 4
```

If you've created the program correctly, a red window should pop up in the center of your screen. If any text was in the window area when you executed the command, you'll notice that it's gone. Drawing a window with WINAT erases everything under the window area. Only text written after you create the window will have the new color

RECT.BAT shows how to use the WINAT utility to draw a series of concentric rectangles of different colors.

```
@ECHO OFF
REM Draw concentric rectangles
REM of different colors
CLS
WINAT  1  1 25 80 7 1
WINAT  3  4 21 72 7 2
WINAT  5  8 17 64 7 3
WINAT  7 12 13 56 7 4
WINAT  9 16  9 48 7 5
WINAT 11 20  5 40 7 6
WINAT 13 24  1 32 0 7
```

End

OVERLAP.BAT draws several small windows that overlap in different ways.

```
@ECHO OFF
REM - Draw overlapping windows
CLS
WINAT  1  1 25 80 7 1 BLUE
WINAT 20 10  4 45 7 2 GREEN
WINAT  5 65 15 10 7 3 CYAN
WINAT 10 40  5 30 7 6 BROWN
WINAT 15  8  7 25 7 5 VIOLET
WINAT  3 50  9  5 0 7 GRAY
WINAT  4  1  3 80 7 0 BLACK
WINAT  2  2 10 20 7 4 RED
```

End

SHADOW.BAT shows how to create an extra call to WINAT to create a drop shadow under a main window for a striking visual effect.

```
@ECHO OFF
REM - Draw a window with a shadow
CLS
WINAT  1  1 25 80 15 1 BLUE
WINAT  7 31 10 21 11 0 SHADOW
WINAT  6 30 10 20 11 4 RED
```

End

NOSHADOW.BAT displays the same main window as SHADOW.BAT, but without the drop-shadow effect.

```
@ECHO OFF
REM - Draw window without shadow
CLS
WINAT  1  1 25 80 15 1 BLUE
WINAT  6 30 10 20 11 4 RED
```

End

attributes. To see this, clear the screen with the CLS command and reexecute the WINAT command shown above. Now display a screen of text, using the DIR /P command, for example. You'll see that wherever the text projects into the window, it appears bright white—an eye-catching touch for any display you're designing.

BOXAT.SCR creates the BOXAT.COM program, which draws a box on the display using one of several styles of graphics characters.

```
N BOXAT.COM
A 100
JMP   133
DB  00,00,00,00,00,00,00
DB  DA,C4,BF,B3,C0,C4,D9
DB  C9,CD,BB,BA,C8,CD,BC
DB  DB,DB,DB,DB,DB,DB,DB
DB  B2,B2,B2,B2,B2,B2,B2
DB  B1,B1,B1,B1,B1,B1,B1
DB  B0,B0,B0,B0,B0,B0,B0
MOV   SI,81
CALL  18D
DEC   AH
MOV   [102],AH
CALL  18D
DEC   AH
MOV   [103],AH
CALL  18D
MOV   [104],AH
CALL  18D
MOV   [105],AH
MOV   AH,F
INT   10
MOV   [108],BH
MOV   AH,3
INT   10
MOV   [106],DX
CALL  18D
DEC   AH
CMP   AH,5
JA    18C
MOV   AL,7
MUL   AH
MOV   SI,109
ADD   SI,AX
MOV   DH,[102]
MOV   DL,[103]
CALL  1AA
MOV   AH,2
MOV   DX,[106]
INT   10
RET
MOV   AX,2901
MOV   DI,5C
INT   21
PUSH  SI
MOV   SI,5D
SUB   AX,AX
LODSB
CMP   AL,20
JZ    1A8
SUB   AL,30
AAD
MOV   AH,AL
JMP   19B
POP   SI
```

```
RET
MOV   BP,DX
MOV   BH,[108]
CALL  1E8
LODSB
SUB   CH,CH
MOV   CL,[104]
DEC   CL
DEC   CL
PUSH  CX
MOV   DX,BP
INC   DH
MOV   BP,DX
MOV   AH,2
INT   10
MOV   AH,A
MOV   CX,1
INT   10
MOV   AH,2
ADD   DL,[105]
DEC   DL
INT   10
MOV   AH,A
MOV   CX,1
INT   10
POP   CX
LOOP  1BE
MOV   DX,BP
INC   DH
MOV   AH,2
INT   10
LODSB
MOV   AH,E
INT   10
LODSB
MOV   AH,A
SUB   CH,CH
MOV   CL,[105]
DEC   CX
ADD   DX,CX
DEC   CX
INT   10
MOV   AH,2
INT   10
LODSB
MOV   AH,A
MOV   CX,1
INT   10
RET

RCX
10D
W
Q
```

End

With a little imagination, you can use the WINAT command to create some snazzy screens. The accompanying RECT.BAT program (page 31, top), for example, makes seven calls to WINAT to draw seven concentric rectangles of different background colors.

The first window occupies the full 80-by-25 screen. Each subsequent window occupies a smaller portion of the screen, creating a stunning display.

Of course, the windows don't have to be concentric. For instance, OVERLAP.BAT (page 31), draws variously sized and colored windows that overlap in different ways.

The Shadow Knows

Windows just used to look like flat, two-dimensional boxes on screen. Then some genius pioneered a visual technique that's now standard: drop shadows.

So what's so special about that? A *drop shadow* is actually a duplicate window, darker in color, that appears offset. The effect is striking and makes the main window look as though it's floating in three dimensions.

Adding drop shadows to even the simplest program can make the display look more professional. You can produce a number of different visual effects by varying both the offset and the size of the shadow window.

The accompanying listing SHADOW.BAT (page 31), first clears the screen to blue, using WINAT to draw a single window the size of the screen. Then it uses WINAT to draw the black drop shadow. Finally, it calls WINAT again to draw the red main window.

To demonstrate how much this simple addition of a shadow improves the display, run NOSHADOW.BAT (page 31, bottom). It draws the same display without the shadow. Run the two programs alternately and you'll see that the display produced by NOSHADOW appears flat and lifeless in comparison.

THE DOS SPECTRUM

You can specify any of the 16 colors listed here for the foreground. Only the colors zero through 7 are valid for the background. If you use values 8 through 15 for the background, DOS selects colors zero through 7, but the foreground text will blink.

VALUE	COLOR
0	black
1	blue
2	green
3	cyan
4	red
5	magenta
6	brown
7	gray (standard white)
8	dark gray
9	light blue
10	light green
11	light cyan
12	light red
13	light magenta
14	yellow
15	bright white

Border Patrol

Plain-colored panels on screen, even with drop shadows, still seem to lack authority. To really make a window stand out, I like to add a box around it as a border. The IBM character set contains some graphics characters that are particularly suited for drawing boxes. Among these are single-line, double-line, and block characters that vary in degree of shading.

Now, you could use the SAYAT utility or even the ECHO command to write boxes to the screen as ordinary characters. But using these methods to draw a box around even a small window would take up many lines in your batch program, and that's just too much work. To make drawing boxes easy, I wrote the utility BOXAT.

To use this program, type in the Debug script BOXAT.SCR (see facing page), and convert it to the executable program BOXAT.COM. To draw a box—in any of several styles, as we'll discuss in a moment—on screen, just enter the following command:

```
BOXAT row col nrow ncol style
```

The first four arguments—*row*, *col*, *nrow*, and *ncol*—are the same as the WINAT command's: top row, left column, number of rows, and number of columns.

The last argument, *style*, indicates which of the six character types you're using, as shown in the second table, "Box Scores" (page 34, bottom).

BOXES.BAT creates the same image as OVERLAP.BAT, but draws boxes around each of the windows.

```
@ECHO OFF
REM - Draw boxes with borders
REM - on top of windows
CLS
WINAT   1   1 25 80 15 1
  BrWH/Blu
BOXAT   1   1 25 80   1
  single line

WINAT 20 10   4 45 13 2
  BrVio/Grn
BOXAT 20 10   4 45   2
  double line

WINAT   5 65 15 10 12 3
  BrRed/Cyan
BOXAT   5 65 15 10   3
  solid block

WINAT 10 40   5 30   8 6
  Blk/Brn
```

```
BOXAT 10 40   5 30   4
  75% block

WINAT 15   8   7 25 10 5
  BrGrn/Vio
BOXAT 15   8   7 25   5    50% block

WINAT   3 50   9   5   9 7
  BrBlu/Gry
BOXAT   3 50   9   5   6
  25% block

WINAT   4   1   3 80 14 0
  Yel/Blk
BOXAT   4   1   3 80   1
  single line

WINAT   2   2 10 20 11 4
  BrCyan/Red
BOXAT   2   2 10 20   2
  double line
```

End

COOLMENU.BAT combines colored windows and borders to create an attractive menu.

```
@ECHO OFF
REM
CLS

REM Clear the entire screen
WINAT   1   1 25 80 15 1
  BrWh/Blu

REM Draw the drop shadow
WINAT   8 31 13 24   0 0
  Blk/Blk

REM Draw the title window
REM and box
WINAT   7 29   3 23 14 4
  Yel/Red
BOXAT   7 29   3 23   2

REM Draw a smaller window
REM to change
REM the color of
REM the title text
WINAT   8 30   1 21 15 4
  BrWht/Red
SAYAT   8 33 "Backup Options"
```

```
REM Draw the main window
WINAT 10 29   9 23 14 4
  Yel/Red
BOXAT 10 29   9 23   2

REM Draw a smaller window
REM to change
REM the color of
REM the title text
WINAT 11 30   7 21 15 4
  BrWh/Red
SAYAT     11 31
  "1) Backup All Files"
SAYAT     13 31
  "2) Backup New Files"
SAYAT     15 31
  "3) Restore Files"
SAYAT     17 31
  "4) Quit"

REM Prompt for a choice
SAYAT     25 1 "Enter Choice:"
KEYGET
```

End

Use the Debug script SAYAT.SCR to create SAYAT.COM, which lets you access special characters and position them on screen—a crucial component of the COOLMENU.BAT program presented in this installment.

```
N SAYAT.COM
A 100
MOV   CL,80
DEC   CL
SUB   CH,CH
MOV   AL,22
MOV   DI,81
REPNZ
SCASB
JNZ   159
MOV   BP,DI
REPNZ
SCASB
JNZ   159
DEC   DI
MOV   AH,F
INT   10
PUSH  BX
SUB   AX,AX
MOV   SI,5D
LODSB
CMP   AL,20
JZ    12D
SUB   AL,30
AAD
MOV   AH,AL
JMP   120
DEC   AH
MOV   DH,AH
SUB   AX,AX
MOV   SI,6D
LODSB
CMP   AL,20
JZ    143
SUB   AL,30
AAD
MOV   AH,AL
JMP   136
DEC   AH
MOV   DL,AH
MOV   AH,2
POP   BX
INT   10
MOV   AH,40
MOV   BX,1
MOV   DX,BP
MOV   CX,DI
SUB   CX,DX
INT   21
RET

R CX
5A
W
Q
```

End

The Debug script KEYGET.SCR creates the executable program KEYGET.COM, which retrieves standard (not extended) ASCII characters from the keyboard buffer. KEYGET is also called in COOLMENU.BAT.

```
N KEYGET.COM
A 100
MOV AH,0        ;Request keyboard function 0: read character
INT 16          ; from the BIOS keyboard service routine
MOV AH,4C       ;Request program end and return exit code
INT 21          ; from DOS service routines

RCX
8
W
Q
```

End

BOX SCORES

Six character types are available for making borders.

STYLE	BOX CHARACTER	ASCII VALUE
1	│ single line	179
2	║ double line	186
3	█ solid block	219
4	▓ 75% shaded block	178
5	▒ 50% shaded block	177
6	░ 25% shaded block	176

The program BOXES.BAT (page 33, top) demonstrates the various box styles you can draw. It creates the same overlapping windows as the OVERLAP.BAT program, but adds a box around each window.

Note that the BOXES utility doesn't let you specify color. When the program draws the box on screen, it assumes whatever color to which you've set that portion of the screen.

To set the box's background or foreground hue, use the WINAT command to color the area, then draw the box. Any portion of the screen outside or inside the box is unaffected.

The Big Picture

Of course, you can combine all the techniques you've seen so far into a single screen.

COOLMENU.BAT (page 33, bottom) does just that. It demonstrates the high quality of the DOS-based screens you can generate with just these two simple utilities—WINAT and BOXAT.

This program uses only a few lines to produce the eye-popping menu in the opening screen shot, complete with double borders and drop shadows.

Note that to make COOLMENU.BAT work, you'll also need the Debug tools SAYAT.SCR, featured in two earlier articles: "Put Some Life into Your Batch Files," *DRG/DOS World* #17, September 1994, page 30, and KEYGET.SCR, featured in "Batch Files Without the Wait" *DRG*#11, September 1993, page 29 (both presented here at left).

Where Do We Go from Here?

The sample batch programs shown here should start you thinking of ways you can dress up your own batch files.

By using windows and color to direct the eye or indicate appropriate choices, you can make even the most mundane, run-of-the-mill batch program look like a professional application. ■

BATCH-FILE MEDIC

Batch Files, Basically

QBasic is better than a batch file in some cases, but batch files still have the edge in file maintenance. Here's how to combine the two to get the best from both.

by Hardin Brothers

In my previous "Batch-File Medic" column ("Turn Up the Volume," *DRG/DOS World* #17, September 1994, page 34), I discussed ways of using a batch file to write a QBasic program, send that program information, and get some information back. Since QBasic is weak at file and directory maintenance, this column will show you how to do the opposite: use QBasic to create and run a batch file. Batch files are much better than QBasic at creating and deleting directories, moving files around, and executing other DOS commands.

This project started with a letter (which, unfortunately, disappeared during a recent office redecoration) from a reader who uses a network server with two large hard drives. (We'll call them C: and X:.) Only drive C is available to users. Every evening, the reader has to copy C: to X: to back up the day's work. Once a week, he also copies everything to a backup tape. The reader wanted to know: Is there a better way? My first impression was that this task was ridiculously easy—just use COPY or XCOPY to copy all the files from one disk to another.

But there's a fly in that ointment, as the reader pointed out. The network users with whom he works create large temporary files. Sometimes these files are still on C: at the end of the day and are deleted the following day or even the following week. Also, users may delete directories and the files they contain as they finish one task and start another. If you simply copy everything from C: to X:, pretty soon X: will be filled to overflowing with unused files and directories.

The reader said he'd been solving the problem by deleting everything from drive X and then copying all files from C: to X:. But this is a long, slow process, especially since most of the files on C: don't change from day to day. The executable files, for example, rarely change, nor do many of the data files.

Although you probably don't have a hard drive dedicated solely to backup, this problem isn't unusual. You may well have a laptop and a desktop computer you need to keep in sync, for example. You can hook them together with DOS's InterLink utility, but how do you make sure they both have the latest version of each file? Do you copy and delete files manually? If so, how do you avoid making mistakes?

My initial idea was to use a set of batch files. The first would go through a list of subdirectories on drive X. If a corresponding subdirectory didn't exist on drive C, the batch file would erase the drive X subdirectory.

Then the batch file would go through all the subdirectories on drive C. If any didn't exist on drive X, the batch file would create them. Finally, the batch file would loop through all the directories on both drives and use the REPLACE command to copy newer and unique files from drive C to drive X.

Loopy Batch Files

How does a batch file loop through all the subdirectories on a drive? Let's take a simple example here. Suppose you want to erase all the BAK files from all subdirectories on a drive; how would you do it?

Technical Editor Hardin Brothers has been working with computers and writing about them for 15 years.

Commands such as DIR and XCOPY have an /S option to work in the current directory and all subdirectories. Is DEL /S *.BAK a valid command? Sorry to say, it isn't. But it's still not too difficult to repeat the same command in every directory on a drive. (See the accompanying sidebar, "Around the Loop and Back," right, for a summary of the procedure outlined here.)

The first step is to create a batch file called DIRECTOR.BAT with at least two lines. The first must be as follows:

```
@CD %2
```

The rest of the batch file contains the command or commands you want to execute in each directory. If you want to delete BAK files, then the entire contents of DIRECTOR.BAT, which you must store on a directory in your PATH setting, is as follows:

```
@CD %2
@DEL *.BAK
```

(The @ signs at the beginning of each line keep the line from being displayed as it's executed.)

The next step is to run a batch file of at least three lines:

```
DIR \ /S | FIND "Directory" >
  C:\DIRLIST.ASC
ECHO EXIT >> DIRLIST.ASC
COMMAND < C:\DIRLIST.ASC
```

The first line extracts the names of subdirectories from a directory of the entire disk. It saves the list of directories in a file. DIRLIST.ASC's format is as follows:

```
Directory of C:\
Directory of C:\4DOS
Directory of C:\AT
Directory of C:\BIN
Directory of C:\BOOT
Directory of C:\BORLAND
```

And so on. The second line adds the command EXIT to the bottom of this file. And the final line runs a new copy of COMMAND.COM and sends it each line of the DIRLIST.ASC file as a command, just as though you'd typed it from the keyboard.

COMMAND.COM looks at each line and sees that the first word is *Directory*. Being a forgiving command processor, COMMAND.COM assumes that you meant to type `Director` and added a *y* by mistake. So it runs the DIRECTOR.BAT program and hands it two parameters. The first, in the variable %1, contains the word *of*. DIRECTOR.BAT simply ignores that parameter. The second parameter, in the variable %2, is the name of a directory.

DIRECTOR.BAT's first line is CD %2: change to the named directory. Then it executes the remainder of its lines and exits back to COMMAND.COM, which receives the next line of DIRLIST.ASC as another command. The last command in the file, EXIT, closes the second copy of COMMAND.COM and returns you to your original batch file, the one that started everything.

Second Impressions

That trick seems as though it should work for this month's problem, but it won't, or at least I can't find a way. How do you change a directory name like C:\BIN into a name like X:\BIN within a batch file? And if you can't generate both forms of the name, how can you compare the directory structures of both drives?

My first impression of the problem had led me into a blind alley. I needed to back up and find a different way to go.

One strategy has always worked well for me when I run into this kind of block: I try to figure out how I would do a task manually. Once I do that, I can usually write a program that follows the same path.

If you gave me a list of the subdirectories on each drive, I'd put them side by side to compare them. As long as the lists were in the same order, finding the differences would be easy.

Making a list of the directories on each drive is simple. The DIR com-

Windows TIP

A BETTER WAY TO COMMUNICATE

Getting most DOS-based communications programs to run under Windows is simple, but teaching Windows to run them in the background while you work on something else in the foreground can be a challenge. If you follow these rules while creating a program information file (PIF) for your communications program, things should go smoothly:

- Make sure that the Background box under the Execute option is checked. Otherwise, Windows will suspend the program when you move it to the background.
- For best results while downloading, select the Advanced option and set the background priority to 10000. This gives the program a big hunk of processing time to ensure that it doesn't miss incoming bytes.
- If you use a permanent swap file and the setting for 32-bit access is checked, make sure that the Lock Application Memory box in the Advanced Options dialog box is also checked. This prevents the program from being swapped out of memory when Windows needs to use the swap file. (In 386 Enhanced mode, swap files are used to improve performance. To find out whether the 32-bit box is checked, choose the Main program group's Control Panel option. Then select 386 Enhanced, Virtual Memory, and Change to bring up the Virtual Memory dialog box.)

In addition, I've found that communications programs seem to have fewer problems running in the background as icons rather than as small windows.

—Paulo A. Shakarian

AROUND THE LOOP AND BACK

Here's a way to repeat a command in every directory on drive C. First create DIRECTOR.BAT and save it in a directory in your PATH:

```
@CD%2
@(place your command or commands here)
```

Now create a batch file with any name you like:

```
@ECHO OFF
DIR \ /S | FIND "Directory" > C:\DIRLIST.ASC
ECHO EXIT >> DIRLIST.ASC
COMMAND < C:\DIRLIST.ASC
```

When you run the second batch file, DIRECTOR.BAT will execute your chosen command in every directory on drive C.

—H.B.

mand's /AD (for *attribute: directory*) switch lets you create a list of directories only. Add the /S (*subdirectory*) switch to look through all subdirectories on the disk, plus the /B (*bare*) switch to throw away all the extraneous information DIR likes to add to a directory listing. Then run everything through the DOS SORT filter, and you have a sorted list:

```
DIR /AD /S /B C:\ | SORT >
  DIRLIST.ASC
```

This line will give you a list of all subdirectories on drive C. Do the same for drive X, and you have your lists. All that's left is some way to compare the two.

A directory name is really nothing more than a string of characters. Unfortunately, DOS's batch language has no facilities for manipulating strings (unless you're using JP Software's 4DOS or its commercial cousin, NDOS, included in The Norton Utilities from Symantec Corp.). But QBasic, included with every copy of DOS, is great at string handling. (See the result in the accompanying program listing, SYNC.BAS, page 38.)

I can hear some of you QBasic mavens complaining that QBasic can do anything a batch file can simply by using the SHELL command. For example:

```
SHELL "DIR /AD /S /B C:\ ... "
```

will execute the DIR command above. Yes, but if you have hundreds or even thousands of DOS commands to execute, SHELL is inefficient. Each time a program uses SHELL, QBasic has to release some of the memory it's using, start a new copy of COMMAND.COM, and send it a command. Once it regains control, QBasic has to recover its memory and then continue with your program. It may be much faster to write all the necessary commands to a batch file and then execute it. That doesn't mean you should never use SHELL (the listing uses it several times); just realize that it will slow down your program.

Once I figured out how to do the job manually, the rest of the solution fell into place quickly. Here's an outline of how I managed the task:

1. Make a sorted list of the directories on each drive.
2. Get the first directory from each list.
3. Compare the directory names alphabetically, but disregard the drive letter.
  A. If the directories are the same, compare the files on drive X and drive C. Then get the next set of directory names.
  B. If the drive C directory comes before the drive X directory, create the directory on drive X and copy the files from drive C. Then get the next directory for drive C.
  C. If the drive X directory comes before the drive C directory, delete the directory from drive X. Then get the next directory for drive X.
4. Unless you're done with both lists, go back to step 3.

In step 3B, you've found a new directory on drive C, the source

DOS TIP

A QUESTION OF PLACEMENT

Usually, when you use the question-mark character (?) in a DOS command, DOS understands that the question mark stands for a single character. For example, when you type `DIR C:\PROJECT\COST??94.MEM`, DOS might list files such as COST0194.MEM, COST0294.MEM, and COST0394.MEM. But for some inexplicable reason, when you place a question mark at the end of a filename or its extension, DOS also interprets the question mark to mean no character at all. The notation TEST?.TXT, for instance, could apply to TEST.TXT as well as TEST1.TXT. Likewise DOS uses the name TEST.TX? to identify files named TEST.TXT and TEST.TX.

To avoid losing important files, keep this peculiarity in mind when you use a question-mark character in a command, such as DEL, that initiates a destructive operation.

—Jack Nimersheim

drive, so you have to create a new directory on drive X. In step 3C, just the opposite has happened; you've found a directory on drive X that no longer exists on drive C. You can erase the drive X directory.

Step 3A is the most complicated of the three possibilities. Before we can use a command like REPLACE to update the files on drive X, we must erase any files that exist only on drive X. And to do that, we must generate a sorted file list of each directory and go through the lists looking for files to delete:

A1. Make a sorted list of the files in each matching directory.
A2. Get the first file from each list.
A3. Then compare the filenames alphabetically.
  i. If they're the same, get the next pair of names.
  ii. If the drive C name comes before the drive X name, get the next drive C name.
  iii. If the drive X name comes before the drive C name, delete the drive X file and get the next drive X name.
A4. Go back to step A3 until you're done with both lists.

These outlines are somewhat simpler than the listing, but not by much. I had to add a way of handling the disappearance of an entire branch on the subdirectory tree in step 3C, plus a way of recognizing the end of the lists, and a way of making sure that all directories have either been added or deleted and all necessary files deleted before the program ends.

After I wrote the program and tested it, I realized it had one glaring omission. The two outlines above ignore the root directories of both drives. If you look carefully at the listing, you'll see that I fixed that problem with a simple kludge (that's a technical word meaning "a sloppy way of fixing a program"): I insisted that the program com-

Sweet harmony: SYNC.BAS synchronizes two disk drives, assuming that you use one for regular work and the other for storage. You must define the drive letters with which you're working (near the beginning of the program), as well as the drive to use for temporary files if neither TEMP nor TMP is defined in the environment.

```
DEFINT A-Z

DECLARE SUB UpdateFiles ()
DECLARE FUNCTION GetDirName$ (FileNum%)
DECLARE FUNCTION GetFileName$ (FileNum%)

CONST Source$ = "C:"
CONST Dest$ = "X:"
CONST DefaultTmpPath$ = "C:\"
DIM SHARED EndMark$, SourceFileList$, DestFileList$
DIM SHARED SourceDir$, DestDir$
EndMark$ = CHR$(255)

CLS
PRINT "Creating batch file to synchronize"
PRINT "drives "; Source$; " and "; Dest$;
PRINT

Tmppath$ = ENVIRON$("TEMP")
IF Tmppath$ = "" THEN Tmppath$ = ENVIRON$("TMP")
IF Tmppath$ = "" THEN Tmppath$ = DefaultTmpPath$

SourceDirList$ = Tmppath$ + "\Source.Dir"
DestDirList$ = Tmppath$ + "\Dest.Dir"
SourceFileList$ = Tmppath$ + "\Source.Fil"
DestFileList$ = Tmppath$ + "\Dest.Fil"
BatchFile$ = Tmppath$ + "\Update.Bat"

' Create the directory lists for each drive

PRINT "Creating directory list of drive "; Source$
SHELL "dir /s /ad /b " + Source$ + "\ | sort > "
  + SourceDirList$
PRINT "Creating directory list of drive "; Dest$
SHELL "dir /s /ad /b " + Dest$ + "\ | sort > "
  + DestDirList$
```

```
OPEN BatchFile$ FOR OUTPUT AS 1
PRINT #1, "@Echo off"
PRINT #1, "CLS"
PRINT #1, "Echo Synchronizing drives "; Source$;
  " and "; Dest$
PRINT #1, "CD "; LEFT$(Source$, 1); ":\"
PRINT #1, "CD "; LEFT$(Dest$, 1); ":\"
CHDIR LEFT$(Source$, 1) + ":\"
CHDIR LEFT$(Dest$, 1) + ":\"

OPEN SourceDirList$ FOR INPUT AS 2
OPEN DestDirList$ FOR INPUT AS 3

SourceDir$ = GetDirName$(2)
DestDir$ = GetDirName$(3)

DO UNTIL SourceDir$ = EndMark$ AND DestDir$
  = EndMark$
   IF SourceDir$ = DestDir$ THEN
      PRINT "Updating directory ";
        MID$(SourceDir$, 2)
      UpdateFiles
      SourceDir$ = GetDirName$(2)
      DestDir$ = GetDirName$(3)
   ELSEIF SourceDir$ < DestDir$ THEN
      PRINT "Creating directory "; Dest$; SourceDir$
      PRINT #1, "MKDIR "; Dest$; SourceDir$
      PRINT #1, "XCOPY "; Source$; SourceDir$;
        "\*.* "; Dest$; SourceDir$
      SourceDir$ = GetDirName$(2)
   ELSE          'SourceDir$ > DestDir$
      PRINT "Deleting directory "; Dest$; DestDir$
      PRINT #1, "DELTREE /Y "; Dest$; DestDir$
      DO
        Temp$ = GetDirName$(3)
      LOOP WHILE INSTR(Temp$, DestDir$) = 1
      DestDir$ = Temp$
```

pare the files in the root directories after it finishes all its other work.

Before you use the program, I suggest you test it thoroughly. Either use it to compare two disks containing data you don't care about or erase the last two lines of the main program (the ones that run and then erase the batch file) and study the batch file the program generates.

Those are the only two lines that can cause any damage to your data (assuming that you type the rest of the program correctly), because they're the only two that have the capacity to erase your files and directories.

I'd hoped to make the program general enough to synchronize parts of the directory trees as well as entire disks. And then I realized that with a little help from DOS, I didn't have to worry.

If you use the SUBST command, you can tell DOS you want to call any subdirectory by a disk letter. For example, while I was testing this program, I told DOS I wanted it to map drive I to the TEMP directory on my C: drive and drive J to the TEMP directory on my D: drive. Then I changed the definitions for SOURCE$ and DEST$, near the beginning of the program, to I: and J:, and the program worked like a charm. Once I finished testing, I changed the letters to C: and X:, but you'll probably have to change them again to fit your system.

Power of Two

DOS's batch-file language and QBasic carry certain limitations, as does every other computer language. But if you combine them, you can often create programs that would be slow or impossible in either language alone.

This month's program demonstrates just one way you can use these two languages together—sometimes the whole really is greater than the sum of its parts. ■

```
    END IF
LOOP

SourceDir$ = ""    'Don't forget the root directories
DestDir$ = ""
UpdateFiles

CLOSE
KILL SourceDirList$
KILL DestDirList$

PRINT "Running batch file to do all the work"
SHELL BatchFile$
KILL BatchFile$

END

FUNCTION GetDirName$ (FileNum)
  IF EOF(FileNum) THEN
    GetDirName$ = EndMark$
  ELSE
    LINE INPUT #FileNum, T$
    GetDirName$ = MID$(T$, 3)
  END IF
END FUNCTION

FUNCTION GetFileName$ (FileNum)
  IF EOF(FileNum) THEN
    GetFileName$ = EndMark$
  ELSE
    LINE INPUT #FileNum, T$
    GetFileName$ = T$
  END IF
END FUNCTION
```

```
SUB UpdateFiles
   SHELL "dir /a-d /One /b " + Source$ + SourceDir$
     + " > " + SourceFileList$
   SHELL "dir /a-d /One /b " + Dest$ + DestDir$
     + " > " + DestFileList$
   OPEN SourceFileList$ FOR INPUT AS 4
   OPEN DestFileList$ FOR INPUT AS 5
   SourceFile$ = GetFileName$(4)
   DestFile$ = GetFileName$(5)

   DO UNTIL SourceFile$ = EndMark$ AND DestFile$
     = EndMark$
     IF SourceFile$ = DestFile$ THEN
        SourceFile$ = GetFileName$(4)
        DestFile$ = GetFileName$(5)
     ELSEIF SourceFile$ < DestFile$ THEN
        SourceFile$ = GetFileName$(4)
     ELSE       'SourceFile$ > DestFile$
        PRINT #1, "DEL "; Dest$; DestDir$; "\";
          DestFile$; " > Nul"
        DestFile$ = GetFileName$(5)
     END IF
   LOOP
   PRINT #1, "Replace "; Source$; SourceDir$;
     "\*.* "; Dest$; DestDir$; " /A /R"
   PRINT #1, "Replace "; Source$; SourceDir$;
     "\*.* "; Dest$; DestDir$; " /R /U"
   CLOSE 4, 5
   KILL SourceFileList$
   KILL DestFileList$
END SUB
```

End

BATCH-FILE MENUS

ANSI Magic: A Trick of the Eye

Beautify your menus with the creative use of extended ASCII line-drawing characters and ANSI.SYS commands.

by Doug Lowe

When it comes to designing interactive programs, presentation is paramount. For users, the right interface—clean, simple, straightforward—can mean the difference between navigating nested menus quickly and smoothly and getting lost in some endless maze of unwanted options.

In the previous issue of *DOS World* (#17, September 1994, page 39), I presented a menu program that was simple and functional—but a bit spartan. The opening screen looked something like this:

```
Main Menu

1. Windows
2. WordPerfect
3. Lotus 1-2-3
4. Utilities

Press Esc to return to DOS.

Enter your choice:
```

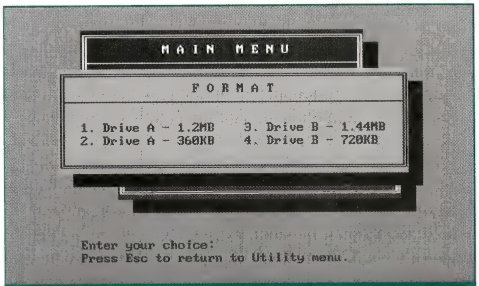
The program displayed this text on screen using nothing more elaborate than a series of ECHO commands. The only formatting consisted of clearing the screen with CLS and displaying blank lines with the command ECHO followed by a period (ECHO.).

But you don't have to settle for unadorned menus just because you're working with batch files; special built-in DOS programming tools let you use color, drop shadows, and single- and double-line boxes effectively to improve their appearance. You can also position menus to look like pop-ups.

The batch files that created the menu series in the accompanying screen shot (right) use two DOS techniques: extended ASCII characters for drawing lines and ANSI.SYS escape sequences for changing screen colors and positioning the cursor. The accompanying program listing, MENU.BAT (see page 42), shows these batch files; compare this listing with the MENU3.BAT batch file in *DOS World* #17, page 43. Although they display their menus differently, the structure and logic are the same.

ASCII Etch-a-Sketch

The first step in creating professional-quality menus is using extended ASCII characters. As you may know, ASCII (American Standard Code for Information Interchange) is the convention that correlates letters of the alphabet, numerals, punctuation, and other



```
M A I N   M E N U

F O R M A T

1. Drive A - 1.2MB     3. Drive B - 1.44MB
2. Drive A - 360KB     4. Drive B - 720KB

Enter your choice:
Press Esc to return to Utility menu.
```

DOS' ANSI.SYS device driver lets you use special ASCII characters to design good-looking pop-up nested menus.

Contributing Editor Doug Lowe is the author of 15 computer books, including The Only DOS Book You'll Ever Need *(Murach),* The Least You Need to Know About DOS *(Murach), and* The Microsoft Press Guide to DoubleSpace *(Microsoft Press).*

special symbols with 1-byte character codes. For example, the letter A is stored as a byte whose decimal value is 65. The numeral 7's decimal value is 55.

Each byte can have a value ranging from zero to 255, but only the first 128 byte values are used for upper- and lowercase letters, numerals, punctuation, and symbols. Rather than let the remaining 128 values go to waste, IBM assigned them special symbols.

Some, such as the upside-down question mark, accented vowels, and Greek letters, are for foreign alphabets. But of special interest to batch-file programmers are the ASCII codes ranging from 179 through 218.

These 40 characters, listed in the first of the accompanying tables ("Drawing Boxes with Extended ASCII Characters," right), are the building blocks for boxes made of single or double lines. (Also listed are a few other characters sometimes used in menu design.)

The only trick to employing these special characters is learning how to type them into your files—after all, there's no "upper-left double-line" key on your keyboard. To produce these characters from DOS's EDIT text editor, hold down the Alt key and type the character's three-digit ASCII code on the numeric keypad (with Num Lock on). Then release the Alt key. For example, to generate that upper-left double-line character, press Alt+201.

Notice how some of the line drawing characters let you mix single- and double-line boxes. To produce the effects shown in the opening screen, the first step is to draw double-line boxes around the menus. When you type in the special characters in the program listing's MAIN.TXT, UTIL.TXT, and FORMAT.TXT files, use ASCII character 186 for the vertical elements, 205 for the horizontal elements, and 187, 188, 200, and 201 for the corners. (On your screen, corner elements and horizontal lines will look solid.) To separate the title from the body of the menu, use the horizontal single-line character (ASCII 196). Where the single line meets the vertical double lines, use ASCII 199 and 182.

Although it's awkward at first, with a bit of practice you'll get pretty good at drawing boxes with these characters—provided you keep a copy of the ASCII table handy. Also, don't forget to take advantage of your text editor's copy-and-paste feature.

For example, to draw a row of 30 single-line characters with the DOS 6.x EDIT command, you don't have to press the Alt+196 key combination 30 times. Instead, enter Alt+196 just three times; then highlight the three single-line characters. Now copy them by pressing Ctrl+ Insert, then duplicate them as many times as needed by pressing the Shift+ Insert key combination.

Fun and Games with ANSI.SYS

To use special ASCII characters, you need ANSI.SYS, a screen enhancement device driver that comes with DOS. You install it by including the following line in your DOS CONFIG.SYS file:

```
DEVICE=C:\DOS\ANSI.SYS
```

If you have a 386 or higher computer and you're using DOS 5 or 6.x, you can stuff ANSI.SYS into upper memory by using this command instead:

```
DEVICEHIGH=C:\DOS\ANSI.SYS
```

DRAWING BOXES WITH EXTENDED ASCII CHARACTERS

To add any of these line-drawing and menu-design characters to a file from DOS's EDIT text editor, hold down the Alt key and type the appropriate three-digit number on the numeric keypad (Num Lock on). When you release the Alt key, the special character will appear.

BOX PART	SINGLE	DOUBLE	MIXED	
horizontal	196 ─	205 ═		
vertical	179 │	186 ║		
upper left	218 ┌	201 ╔	214 ╓	213 ╒
upper right	191 ┐	187 ╗	183 ╖	184 ╕
lower left	192 └	200 ╚	211 ╙	212 ╘
lower right	217 ┘	188 ╝	189 ╜	190 ╛
middle left	195 ├	204 ╠	199 ╟	198 ╞
middle right	180 ┤	185 ╣	182 ╢	181 ╡
middle top	194 ┬	203 ╦	210 ╥	209 ╤
middle bottom	193 ┴	202 ╩	208 ╨	207 ╧
center cross	197 ┼	206 ╬	215 ╫	216 ╪

OTHER USEFUL CHARACTERS

176 ░
177 ▒
178 ▓
219 █
220 ▄
221 ▌
222 ▐
223 ▀

Other commands required to activate DOS 5/6 memory management features, however, must come before this line.

In particular, the following lines should appear in the sequence shown here to activate DOS 5/6 memory management and load ANSI.SYS into upper memory:

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS
DOS=HIGH,UMB
DEVICEHIGH=C:\DOS\ANSI.SYS
```

If you're using DOS 6, you can add the DEVICE=C:\DOS\ANSI.SYS command to CONFIG.SYS, then run the MEMMAKER command and let DOS optimize the memory configuration for you.

You use ANSI.SYS by embedding special commands called *escape sequences* into the text displayed by your batch files. Escape sequences let you change the color of the text displayed subsequently on screen. In addition, ANSI.SYS has another valuable function: It lets you move the cursor to a specific screen location. (See the second and third tables, "ANSI.SYS Color Tricks," and "ANSI.SYS Cursor Tricks," page 44, for lists of ANSI.SYS color codes and escape sequences.)

Each ANSI.SYS escape sequence consists of an escape character (ASCII code 27) followed by a left bracket and one or more characters. For example, to move the cursor to row 5 column 15, you'd type the escape sequence `←[5;15f`. (The left-arrow symbol represents the escape character.) To change the display to blue characters on a cyan background, just type the sequence `←[34;46m`.

If this is your first crack at fiddling with ANSI.SYS escape sequences, you'll soon discover that the hardest part about using them is figuring out how to insert the escape character into the batch file. The Escape key doesn't work, because the text editor intercepts it. From the DOS 5/6 EDIT text

MENU.BAT generates snazzy-looking menus, complete with shadowing and special effects.

```
@echo off
:Start
echo ←[34;46m
cls
type main.txt
choice /c1234← /n ←[21;20fEnter your choice:
if errorlevel 5 goto Exit
if errorlevel 4 goto Utils
if errorlevel 3 goto Lotus
if errorlevel 2 goto WordPerfect
if errorlevel 1 goto Windows
goto Exit

:Utils
type util.txt
choice /c1234← /n ←[21;20fEnter your choice: ←[D
if errorlevel 5 goto Start
if errorlevel 4 goto DailyBU
if errorlevel 3 goto WeeklyBU
if errorlevel 2 goto Format
if errorlevel 1 goto Scan
goto Exit

:Lotus
cd \123R23
123
goto Start

:WordPerfect
cd \wp50
wp
goto Start

:Windows
cd \windows
win
goto Start

:DailyBU
cd \dos
msbackup incrc
call main
goto Utils

:WeeklyBU
cd \dos
msbackup fullc
call main
goto Utils

:Format
type format.txt
choice /c1234← /n ←[21;20fEnter your choice: ←[D
if errorlevel 5 goto FormatEsc
if errorlevel 4 goto B720
if errorlevel 3 goto B144
if errorlevel 2 goto A360
if errorlevel 1 goto A12
goto Exit

:Scan
scandisk
call main
goto Utils

:FormatEsc
echo ←[34;46m
cls
type main.txt
```

editor, you press the Ctrl+P key combination, then press Escape. The character will appear as a left-pointing arrow. If you use a different text editor, you'll have to consult that program'sdocumentation for instructions on inserting special characters.

There are several ways to send the ANSI.SYS escape sequences to the screen. The easiest is to put them into an ECHO command. For example, this command:

```
ECHO ←[34;46m
```

changes the screen colors.

Another way to send escape sequences is to place them in a text file along with any text you want to display, then use the TYPE command to send the text file to the screen. This is the technique I use in MENU.BAT. It's much faster than executing a long series of ECHO commands.

Getting Down to Business

As noted above, one use for ANSI.SYS escape sequences is to change screen colors, such as blue characters on a cyan background (with Esc[34;46m).

In MENU.BAT's MAIN.TXT file, that's the very first thing the program sends to the printer. Next, MAIN.TXT sends another sequence, Esc[2J, which clears the screen. Clearing the screen sets the entire screen to the current background color. As a result, this creates a cyan background against which the program displays the menus.

After clearing the screen, MAIN.TXT specifies a third sequence, Esc[1;37;44m. This changes the screen colors to white characters on a blue background, but also sets the intensity attribute to bright so that the white letters will appear bright white.

Note that the other menu files in the accompanying listing—UTIL.TXT and FORMAT.TXT—use a slightly different escape sequence to produce different menu colors.

```
goto Utils

:B720
cls
format b: /f:720KB
call main
goto Utils

:B144
cls
format b:
call main
goto Utils

:A360
cls
format a: /f:360KB
call main
goto Utils

:A12
cls
format a:
call main
goto Utils

:Exit
echo ←[37;40m
cls

←[1;37;44m
←[5;20f ═══════════════════════════════════
←[6;20f║         M A I N   M E N U        ║←[40m  ←[44m
←[7;20f║──────────────────────────────────║←[40m  ←[44m
←[8;20f║                                  ║←[40m  ←[44m
←[9;20f║        1. Windows                ║←[40m  ←[44m
←[10;20f║       2. WordPerfect              ║←[40m  ←[44m
←[11;20f║       3. Lotus 1-2-3              ║←[40m  ←[44m
←[12;20f║       4. Utilities                ║←[40m  ←[44m
←[13;20f║                                   ║←[40m  ←[44m
←[14;20f║═══════════════════════════════════║←[40m
←[15;22f                                     ←[0;34;46m
←[22;20fPress Esc to Exit.

←[1;37;41m
←[8;25f ════════════════════════════════════
←[9;25f║          U T I L I T I E S        ║←[40m  ←[41m
←[10;25║───────────────────────────────────║←[40m  ←[41m
←[11;25f║                                   ║←[40m  ←[41m
←[12;25f║       1. Scan hard disk           ║←[40m  ←[41m
←[13;25f║       2. Format a disk            ║←[40m  ←[41m
←[14;25f║       3. Weekly backup            ║←[40m  ←[41m
←[15;25f║       4. Daily backup             ║←[40m  ←[41m
←[16;25f║                                   ║←[40m  ←[41m
←[17;25f║ ══════════════════════════════════║←[40m
←[18;27f                                     ←[0;34;46m
←[22;20fPress Esc to return to Main Menu.

←[34;47m
←[8;17f ════════════════════════════════════════════
←[9;17f║                F O R M A T                ║←[40m  ←[47m
←[10;17f║───────────────────────────────────────── ║←[40m  ←[47m
←[11;17f║                                           ║←[40m  ←[47m
←[12;17f║  1. Drive A – 1.2MB  3. Drive B – 1.44MB  ║←[40m  ←[47m
←[13;17f║   2. Drive A – 360K   4. Drive B – 720K   ║←[40m  ←[47m
←[14;17f║                                           ║←[40m  ←[47m
←[15;17f║═══════════════════════════════════════════║←[40m
←[16;19f                                             ←[0;34;46m
←[22;20fPress Esc to return to Utility menu.
```

End

You may have noticed the peculiar escape-sequence combination that follows each line except the first in the MAIN.TXT file:

```
←[40m  ←[44m
```

These two escape sequences, plus the two spaces that fall between them, are what create the drop-shadow effect in the screen shots.

The first escape sequence in the line above switches the background color to black. Then the program displays two spaces. Since spaces show up as background color, the result is two spaces of black.

Finally, the program switches the background color back to blue so that the next line of the menu is displayed in the correct color. The effect is completed by a final line of spaces displayed in the drop-shadow background color (the 12th line in MAIN.TXT).

Note that the cursor positioning for this line of spaces offsets the drop shadow by two characters: While the menu itself begins in column 20, the drop-shadow line begins in column 22.

The UTIL.TXT and FORMAT.TXT menu files include similar drop shadows. The only differences are the last line's cursor position and the background colors. Here's a handy design point for novice menu programmers: As a general rule, drop shadows look best on screen offset one line down from the menu and two characters to the right.

ANSI.SYS escape sequences also let you position text quickly without having to send spaces to the screen. For example, to display text starting at column 21, you could use a line that begins with 20 spaces followed by text, or you could use an ANSI.SYS escape sequence to direct the cursor to column 21. In MAIN.TXT, UTIL.TXT, and FORMAT.TXT, just about every line begins with an ANSI.SYS escape sequence that sends the cursor to a specific location. It's one of DOS's most useful precision programming tools. ■

ANSI.SYS COLOR TRICKS

The escape sequence to set colors is Esc[*n*;...;np, where *n* is a number indicating which color attribute to set (any of the values shown below).

Text Attributes	
0	normal text
1	bright text
4	underscored text (monochrome monitors only)
5	blinking text
7	reverse foreground and background
8	hide the text

Foreground Colors	
30	black
31	red
32	green
33	yellow
34	blue
35	magenta
36	cyan
37	white

Background Colors	
40	black
41	red
42	green
43	yellow
44	blue
45	magenta
46	cyan
47	white

Examples

Esc[34;46m	Sets foreground color to blue and background color to cyan.
Esc[1;37;44m	Sets bright text attribute, foreground color to white, background color to blue.

ANSI.SYS CURSOR TRICKS

Use these escape sequences to put the cursor exactly where you want it. Note that *Esc* stands for a single occurrence of the escape character. To enter an escape character from the DOS 5/6 EDIT text editor, type Ctrl+P, then press the Escape key. The escape character will appear on the screen as a left-facing arrow.

Escape sequence	Example	Explanation
Esc[row;colf	Esc[5,20f	Moves the cursor to the indicated position. The first line on the sreen is line zero, and the first column is column zero.
Esc[row;colH	Esc[5,20H	Same as above.
Esc[nA	Esc[1A	Moves the cursor up the indicated number of lines.
Esc[nB	Esc[1B	Moves the cursor down the indicated number of lines.
Esc[nC	Esc[20C	Moves the cursor right the indicated number of column positions.
Esc[nD	Esc[20D	Moves the cursor left the indicated number of column positions.
Esc[s	Esc[s	Saves the current cursor position.
Esc[u	Esc[u	Returns the cursor to the previously saved position.
Esc[2J	Esc[2J	Clears the display.
Esc[K	Esc[K	Erases from the current position to the end of the line.

UTILITIES SOURCEBOOK

Maximizing Memory With QEMM

If DOS can't satisfy a program's hunger for memory, perhaps QEMM can. These words of advice will guide you through the program's setup.

by Robert Gryphon

If you've had it with MS-DOS and its memory managers—EMM386.EXE and HIMEM.SYS—when trying to clear as much memory as possible to run applications, you might give Quarterdeck's QEMM a try ($99.95; 800-354-3222 or 310-392-9851). It's smarter than MS-DOS about finding unused areas in the 640K-to-1MB upper-memory range, and, if you set it up right, can offer many 386 and 486 computer owners over 100K more in conventional (640K) memory than some versions of MS-DOS. (See the accompanying sidebar "Key Features of QEMM," page 46, for a quick summary of the product's memory-management functions.)

Some people think of memory management as a black art—and they're right—but good memory management pays real dividends when you're working with large or multiple word-processor or spreadsheet files. Perhaps you're running a program that's supposed to use more memory than the usual 640K, but seems unable to use the extra you've installed. Here, too, a commercial memory manager may answer the need.

If you already own QEMM, I'll offer you some tips on using it, and if you're trying it for the first time, I recommend that you install it in advanced mode so that you can customize it. And remember, anything can happen with memory-management experiments, so have a bootable floppy with a text editor ready.

While QEMM is installing, it will add several lines to your CONFIG.SYS file and offer you a number of choices, including expanded-memory setup, Stealth options, and DOS-UP options.

I recommend letting QEMM set up expanded-memory (EMS) support for your programs that need it. This also lets several of QEMM's special features work. Use the QEMM utility DOS-UP as well, to relocate portions of DOS to upper memory. At this point, skip the Stealth and Stealth DoubleSpace utilities, which relocate portions of ROM; they may crash your system. I find it's easier to set them up later.

When QEMM finishes these opening procedures, you're asked whether QEMM should optimize your memory. Skip this step for now; you're better off optimizing manually.

Why? If you're loading a substantial number of memory-resident programs, QEMM will have to test thousands of possible load orders. If you're methodical, you can probably do just as well on your own in a lot less time. You can always run QEMM's optimization later.

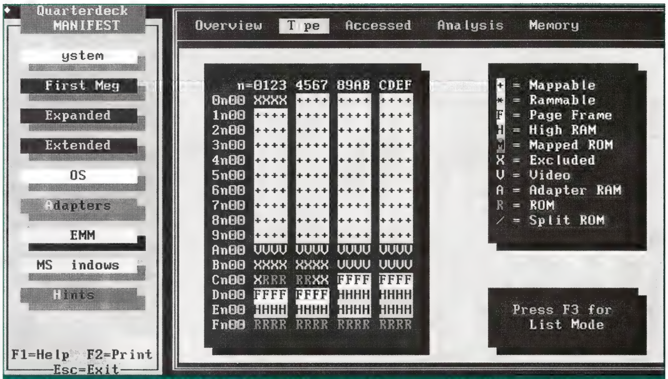
What You See Is What You've Got

After installing QEMM and rebooting your machine, use QEMM's analysis utility, Manifest, to examine

Robert Gryphon is a free-lance writer and programmer/analyst in Redmond, Washington. He welcomes your questions and comments. Contact him on CompuServe at 70541,3420.

how your system's memory is currently allocated.

To run Manifest, type `MFT` at the DOS prompt. At Manifest's main menu, choose QEMM, then Type. The resulting screen shows how every 4K region of your system's first megabyte of memory is allocated. (See the first sample memory map, right.)



```
     n=0123 4567 89AB CDEF
0n00 XXXX ++++ ++++ ++++
1n00 ++++ ++++ ++++ ++++
2n00 ++++ ++++ ++++ ++++
3n00 ++++ ++++ ++++ ++++
4n00 ++++ ++++ ++++ ++++
5n00 ++++ ++++ ++++ ++++
6n00 ++++ ++++ ++++ ++++
7n00 ++++ ++++ ++++ ++++
8n00 ++++ ++++ ++++ ++++
9n00 ++++ ++++ ++++ ++++
An00 VVVV VVVV VVVV VVVV
Bn00 XXXX XXXX VVVV VVVV
Cn00 XRRR RRXX FFFF FFFF
Dn00 FFFF FFFF HHHH HHHH
En00 HHHH HHHH HHHH HHHH
Fn00 RRRR RRRR RRRR RRRR
```

```
+ = Mappable
* = Rammable
F = Page Frame
H = High RAM
M = Mapped ROM
X = Excluded
V = Video
A = Adapter RAM
R = ROM
/ = Split ROM
```

Sample memory map. QEMM's Manifest utility generates a map of the first megabyte of memory in your PC. Beside it is a legend explaining the symbols. Plus signs (+), for example, indicate regular DOS memory, and *H*s indicate available regions of high memory. Each row contains 16 characters, while each character represents 4K of memory; thus a row represents 64K of addressable space. By replacing the *n* with a number or letter from each column heading, you can find a particular 4K area.

The area of greatest interest is the bottom third of the map, the lines prefaced by *An00* through *Fn00*. As you may already know, these are hexadecimal (base 16) values. Each of the lines represents a 64K region of memory (four 16K segments). The line following *An00* represents the 64K memory region beginning at the 640K boundary; *Fn00* marks the beginning of the 64K region that abuts the 1MB mark. (The *n* is replaced by the hexadecimal number at the head of the column.)

If you look more closely at Manifest's grid, you'll see that different letters appear in the various lines. A legend to the right of the display explains what each letter code means. The areas containing *H*s indicate blocks of free upper memory into which you may load drivers and memory-resident programs. For the moment, also consider the regions marked with the letter *F* (representing the page-frame area) as free memory.

Note that this screen indicates one zone of contiguous free upper RAM: from C800 up to (but not including) F000. (Remember, these addresses wrap at the end of each line on the grid.)

The *F*s indicate 64K of upper memory that QEMM chooses to use for the expanded-memory page frame. Earlier, I recommended this expenditure of high memory. Setting aside this area lets you use high memory as expanded memory (for programs that employ it) and gives you room in which to add QEMM's Stealth features. If you're game, now's the time to tackle relocating some of your memory board's addresses. (For instructions, see the sidebar "Reassigning Memory Locations," facing page.)

Configuring QEMM for Stealth

QEMM's Stealth features take the bits of ROM scattered throughout upper memory and remap them to extended memory, freeing large contiguous blocks of RAM for use by device drivers and TSRs.

To put Stealth to work, you'll have to edit your CONFIG.SYS file. There are two options, M and F. Use QSETUP or a text editor to open your CONFIG.SYS file. Add the following: To specify a Stealth mode, enter the `ST:M` or `ST:F` parameter on the DEVICE=QEMM386.SYS line in your CONFIG.SYS file.

KEY FEATURES OF QEMM

QEMM does everything possible to maximize your PC's available memory:

- It frees up conventional memory by taking the drivers and TSRs usually loaded into conventional memory and moving them into suitable upper-memory blocks in the 640K-to-1MB region. As a result, you may load the drivers and pop-up programs you need, yet still have room to run massive DOS applications, such as spreadsheets, database managers, and video games.

- It acts as an extended-memory (XMS) manager and expanded-memory (EMS) manager, providing support for the 64K region just after the 1MB address mark: the high-memory area (HMA). QEMM can configure memory as one large pool that programs use as either extended or expanded memory.

- Its special features let you squeeze the last bytes of memory from your system. DOS-UP, for instance, relocates significant portions of DOS itself to upper memory. In addition, Stealth DoubleSpace loads the driver for MS-DOS 6.x's DoubleSpace disk-compression program into expanded memory; VIDRAM frees up the EGA/VGA graphics-memory area for use as additional base memory.

—R.G.

Stealth/M mode attempts to relocate all system and video ROM regions into extended memory. If you configure your system this way and your PC won't boot or work correctly, you can experiment with excluding specific ROM regions that don't want to be relocated. This involves a tedious process of elimination, however: exclude a memory range, see whether it works; if not, exclude a different range and try again. If you're not up for the challenge, try Stealth/F mode: It attempts to relocate only 64K of ROM and share that ROM's space with the page frame.

After enabling Stealth, run Manifest and bring up the QEMM/Type screen again. (See the second memory-map screen shot, page 48, top.) You should see a lot more *H*s (free high-memory areas) and fewer *R*s (ROM areas in use). Print the new grid in preparation for the final step: optimizing placement of device drivers and TSRs in upper memory.

Filling in the Gaps

Bring up Manifest's First Meg: Programs screen, which lists the drivers and TSRs your computer loads currently. Next to each program name, Manifest lists its run size. Print this screen and compare the memory requirements of your drivers and TSRs against the areas the QEMM/Type printout indicates are free.

Each *H* on the grid represents 4K of free memory. To find the size of an unbroken area of memory, multiply the number of *H*s in a string by 4K.

If you use only a couple of drivers and TSRs—perhaps ANSI.SYS and a mouse driver—they may fit into available memory regardless of the order in which you load them. You can breathe a sigh of relief and consider your memory optimized. But if you load a mouse driver, a network driver, a fax-board driver, and a disk-caching program, you'll probably need to play with load

REASSIGNING MEMORY LOCATIONS

In an ideal world, all of your system's free memory regions would be contiguous. When you run Manifest on your system, however, it will probably reveal breaks in the line—*R*s, indicating memory that ROM is using, or *A*s, indicating use by video adapters and the like. These breaks present obstacles to optimizing memory use.

A program can load into upper memory only in contiguous blocks that together are as large as the run size of the program: that is, the space the program occupies when it's running. You may load several drivers and memory-resident programs into one block, but together their run sizes can't exceed the size of the block.

You can create more contiguous space in memory by finding alternate homes for some of the *A*s, but you have to do it manually.

First, use Manifest's print feature (press F2) to get a printout of the memory map. Look for a row in which the letter *A* breaks up a row of *H*s (the row labeled *Dn00* in the first memory map, for example). Scan up the column in which the *A* resides to find the column heading (the hexadecimal value A in the map). Then substitute the heading value for the *n* in the row heading and write down that number (*Dn00* becomes *DA00*) on your printout; this value tells you which memory location is in use. Repeat this procedure for every instance in which an *A* breaks up free memory.

Next, you need to find out which adapter is responsible for which A region. If you're lucky, this information is in your hardware's documentation. If you don't find it there, you have to do some investigating.

Some Industry Standard Architecture (ISA) cards come with their own setup utilities that can tell you the memory locations the board uses. With most ISA adapters, however, you must check the placement of a board's switches to find out which memory locations it uses. To read these switches, you must open your computer case, locate the adapter, and use the diagrams or directions in the card's documentation. Usually, this is simpler than it sounds, but be careful. Disconnect the computer's power cord first and touch a metal object to discharge static electricity. If you have Enhanced Industry Standard Architecture (EISA), things are easier: Simply run the EISA configuration utility for your PC and look through the adapter configuration screens.

The next challenge is finding the usually limited set of memory locations to which you may set each card, then reconfiguring the cards one by one. (Testing one card at a time helps you track down problems.)

In the first memory map, one adapter-memory region is at address DA00. It would be ideal to relocate the adapter memory to address B000, on the leftmost edge of the smallest of the free-memory zones. But if the card doesn't permit B000 as an alternative, you have to examine the other choices. If it offers B400, for instance, I'd recommend taking it because, as the grid shows, relocating information to B400 splits up a small free-memory block rather than a large one.

Follow your adapter's instructions for reassigning the card's memory: These instructions will vary, believe me. Then, check the board's documentation to see whether you must also reconfigure the software that uses that adapter. After changing the memory address of a network adapter, for example, typically you must alter your CONFIG.SYS file, usually by running a special utility.

Next, test your new setup by rebooting and running some of your more challenging software: Windows, for example, and a few other large or unique applications. When testing goes smoothly, work on relocating the next A in your grid. After you've cleared areas of adapter memory, you're ready to activate QEMM's Stealth features.

—R.G.

order to fit as many programs as possible into upper memory.

Why does the order in which programs are loaded matter? You've already found the run sizes of the programs; you can simply match the different free upper-memory zones in your PC to the drivers and TSRs you're loading—right? Unfortunately, it's not that easy. Many programs take up considerably more memory during the brief period in which they're being loaded. For a program to fit into a space in high memory, it must have enough room to load, even if it uses less while running.

To determine approximately how much memory a program needs during loading, check the size of its executable or driver file. To find the load size of the ANSI.SYS driver, for example, look at the program's directory entry (probably in C:\DOS). Modify your CONFIG.SYS and AUTOEXEC.BAT files so that they load the biggest drivers and TSR programs first, then the smaller programs. (You'll have to break this rule if a certain driver or TSR simply must be loaded before another—network drivers, for example.)

After arriving at a combination you think will work, it's time to put QEMM's LOADHI.SYS driver and LOADHI.COM program to work. At this point your CONFIG.SYS and AUTOEXEC.BAT files are arranged to load the programs in the proper order, but you haven't yet told DOS to load the programs into the appropriate high-memory regions. QEMM offers various ways to tell these utilities the specific region into which you want to load a particular program, but if you don't give it any such information, LOADHI will make its best guess. Take a look at the sample CONFIG.SYS line below, which loads a device driver:

```
DEVICE=C:\DOS\ANSI.SYS
```

To load this device driver into upper memory instead, simply change the line to the following:

```
DEVICE=C:\QEMM\LOADHI.SYS
  C:\DOS\ANSI.SYS
```

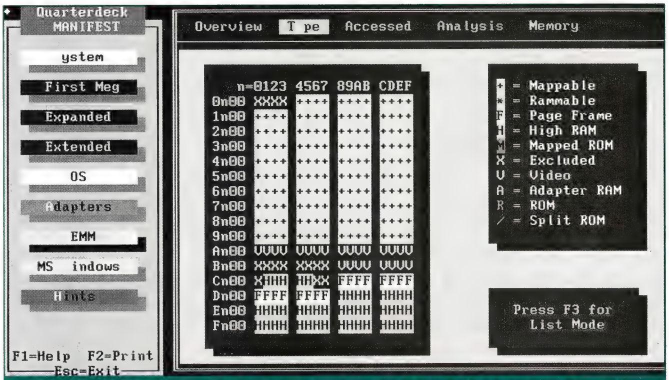
Similarly, you should change the following AUTOEXEC.BAT line, which loads a mouse-support TSR program:

```
C:\MOUSE\MOUSE
```

to this:

```
C:\QEMM\LOADHI C:\MOUSE\MOUSE
```

If you run into difficulty, refer to QEMM's documentation and the README file on the program disk; they're packed with configuration and troubleshooting tips. ■



```
   n=0123 4567 89AB CDEF
0n00 XXXX ++++ ++++ ++++
1n00 ++++ ++++ ++++ ++++
2n00 ++++ ++++ ++++ ++++
3n00 ++++ ++++ ++++ ++++
4n00 ++++ ++++ ++++ ++++
5n00 ++++ ++++ ++++ ++++
6n00 ++++ ++++ ++++ ++++
7n00 ++++ ++++ ++++ ++++
8n00 ++++ ++++ ++++ ++++
9n00 ++++ ++++ ++++ ++++
An00 VVVV VVVV VVVV VVVV
Bn00 XXXX XXXX VVVV VVVV
Cn00 XHHH HHXX FFFF FFFF
Dn00 FFFF FFFF HHHH HHHH
En00 HHHH HHHH HHHH HHHH
Fn00 HHHH HHHH HHHH HHHH
```

```
+ = Mappable
* = Rammable
F = Page Frame
H = High RAM
M = Mapped ROM
X = Excluded
V = Video
A = Adapter RAM
R = ROM
/ = Split ROM
```

```
Press F3 for
 List Mode
```

Sample memory map generated by Manifest after enabling QEMM's Stealth feature. Stealth retrieves scattered bits of ROM from upper memory and remaps them to extended memory. Note the additional *H*s (available high-memory areas) and fewer *R*s (ROM areas in use).

DOS TIP

DO YOU COPY?

If you need to add text to an existing ASCII file without loading your word processor, DOS offers more than one way to get the job done fast.

For instance, suppose that the text you want to add is in your head, and you want to add it to the end of a file named C:\MYTEXT.TXT. A command such as this one does the job:

```
ECHO These are the words I want to add. >> C:\MYTEXT.TXT
```

If the text is in a file named C:\ADDTHIS.TXT, however, and you want to add the text to a file you've named C:\MYTEXT.TXT, you may use either this command:

```
COPY C:\MYTEXT.TXT + C:\ADDTHIS.TXT C:\MYTEXT.TXT
```

or this one:

```
TYPE C:\ADDTHIS.TXT >> C:\MYTEXT.TXT
```

—John Wolfskill

Troubleshooting with QEMM

What are the benefits of using QEMM instead of the memory management that comes free with DOS? The most obvious benefit is QEMM's ability to get you more conventional application memory with less user effort. With QEMM, conventional-memory totals of 590K to 640K are typical, even after you've loaded disk-compression software, a CD-ROM driver, mouse utilities, and other TSRs. With DOS alone, a similar configuration often yields less than 550K of conventional memory—not enough to run some graphics and multimedia applications or to defragment a large hard-disk partition.

Another advantage of QEMM is its finer control of hardware and software memory. You can speed up your computer by setting up shadow RAM in any hardware-ROM address space. QEMM lets you sort memory by speed so that you can reserve faster RAM for applications, while using slower RAM for disk cacning. QEMM also lets you fine-tune every detail of extended and expanded memory management. That feature lets you reconcile memory-address conflicts in computers with unusual or finicky utilities; with QEMM, you can transparently run network drivers, advanced backup programs, and disk caches that may balk under Microsoft's memory manager.

The following tips show you how to take advantage of QEMM's fine-tuning features to gain even more application memory and to resolve some problems arising from nonstandard hardware configurations.

—Lenny Bailes

TIP #1

More Memory For DOS Sessions Within Windows

You can increase the amount of memory available to a DOS session within Windows by 20K to 32K by placing the line DOS=UMB into your CONFIG.SYS file. This addition forces Windows to load its translation buffers above 640K instead of into conventional memory. (By default, upon installation, QEMM removes the DOS=UMB line, since it uses its own LOADHI drivers.)

Be careful, though: On some systems, loading Windows' buffers into upper memory can cause performance problems. If you encounter a general protection fault or some other anomaly, you'll need to remove the DOS=UMB line from your CONFIG.SYS file.

TIP #2

More than 700K Of Memory for Text-Based DOS Sessions Within Windows

If you run text-based DOS programs from within Windows, you may increase the amount of memory available to each by as much as 96K by borrowing EGA/VGA video memory. Just run QEMM's VIDRAM utility from the DOS command line inside a window:

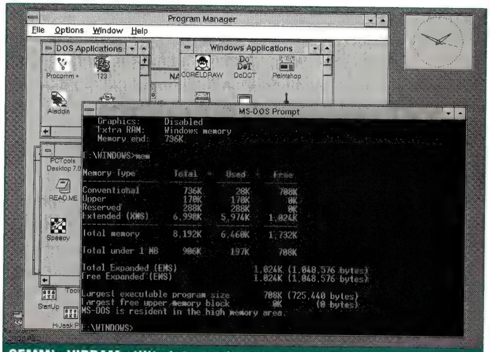
```
[d:]\QEMM\VIDRAM ON
```

You can't run programs that need EGA or VGA graphics, but you can get up to 736K for spreadsheets, word processors, and other text-based programs. You may restore EGA/VGA graphics to the session by typing `VIDRAM OFF` from the command line. This will return the session's available conventional memory to the traditional 640K limit.

You can also annex the EGA/VGA video-memory area in a DOS session by running VIDRAM from a start-up batch file:

```
MOREMEM.BAT VIDRAM ON [d:]\path\[YOURAPP.EXE]
```

Click on the Program Manager icon for your application, open the Properties dialog box, and type `MOREMEM.BAT` as a substitute for the program's name in the Command Line box. (See the accompanying screen shot, below.)



```
  Graphics:      Disabled
  Extra RAM:     Windows memory
  Memory end:    736K

F:\WINDOWS>mem

Memory Type        Total  =   Used  +   Free
----------------  -------   -------   -------
Conventional        736K      28K      708K
Upper               170K     170K        0K
Reserved            288K     288K        0K
Extended (XMS)    6,998K   5,974K    1,024K
----------------  -------   -------   -------
Total memory      8,192K   6,460K    1,732K

Total under 1 MB    906K     197K      708K

Total Expanded (EMS)                 1,024K (1,048,576 bytes)
Free Expanded (EMS)                  1,024K (1,048,576 bytes)

Largest executable program size        708K (725,440 bytes)
Largest free upper memory block          0K       (0 bytes)
MS-DOS is resident in the high memory area.

F:\WINDOWS>
```

QEMM's VIDRAM utility lets you borrow some video memory to run text-based DOS programs within Windows.

TIP #3

Resolving QEMM Disk-Buffer Conflicts

Occasionally some hardware device drivers will cause trouble if you add them to your CONFIG.SYS file after you've installed QEMM. You may get a message that the device driver is attempting to write illegally to expanded memory, plus instructions to reboot the system without QEMM and remove the offending program. (This is most common when CONFIG.SYS attempts to load an expanded-memory disk cache or another program that requests access to EMS.)

In addition, if your system includes an advanced hard-disk controller, you may find that its performance with QEMM loaded is slower than expected. Appending the DiskBuf (DB) parameter to the QEMM command line will usually resolve these problems.

QEMM version 7 can detect the presence of an advanced disk controller and allocate a separate 2K disk buffer for it. If you're using Microsoft's DoubleSpace disk compression, however, you may need to type in the parameter `DB=2` as an addition to the QEMM command line.

If a message that a program is writing illegally to EMS persists after you add the DB=2 parameter, an additional QEMM parameter, DISKBUFFRAME (or DBF) =nn, should resolve the problem. This tells QEMM to allocate additional (nn) conventional memory as a disk buffer, and to send through this buffer all BIOS disk accesses that transfer information in or out of EMS.

Using QEMM's Stealth Feature

One of the secrets of QEMM's success is its Stealth technology. Stealth temporarily shifts video-controller and ROM BIOS out of the first megabyte of memory. The Stealth feature is the most delicate area of QEMM's operation. Although Stealth works flawlessly on the majority of brand-name and clone systems, it can occasionally cause problems when misconfigured. The following two tips clarify some common Stealth scenarios.

TIP #4

Loading Block Device Drivers Before QEMM In CONFIG.SYS

If you must load a device driver before QEMM in your CONFIG.SYS file (such as a TSR to turn on an external CPU cache, or some SCSI drivers), turning on QEMM's Stealth feature can cause a memory conflict. To preload a device driver before QEMM, you must first load QEMM's HOOKROM.SYS driver. This lets the preloaded device driver claim system interrupts or establish pointers to the ROM BIOS even when QEMM's Stealth is active:

```
Device=HOOKROM.SYS
Device=[YOURDRIVER.SYS]
Device=[d:]\QEMM\QEMM386.SYS
  RAM ST:M
```

TIP #5

Using QEMM's ROM-Shadowing Feature

QEMM's ROM-shadowing feature copies the code in your computer's BIOS and slower video ROMs into RAM, which is faster. In some cases, using QEMM will generate faster system performance than your motherboard's built-in shadow-RAM feature. To find out whether that's true on your computer, you can run Quarterdeck's Manifest utility.

Remove any ROM or ROM= settings on the QEMM command line, reboot the system, and make sure your system's hardware shadow ROM (if any) is turned on. Run Manifest and select the First Meg Timing option. Pay particular attention to the numbers shown for the "alphabetical" upper-memory blocks (C000 to Cfff, D000 to Dfff, and so on). You can save the results shown on screen by selecting F2 and printing it to a file.

Next, reedit the QEMM command line in your CONFIG.SYS file and enter the ROM parameter before any Stealth parameter (ST:M or ST:F).

Now reboot your system and run the Manifest First Meg Timing option again. On many systems you'll see an improvement in the areas allocated for video ROM or for EMS (usually C000 to Cfff and E000 to Efff).

Inserting a ROM parameter without specifying particular upper-memory addresses allots 96K of upper memory to faster RAM. If Manifest shows a speed improvement in only some of the tested upper-memory areas, you can specify particular address ranges for QEMM to shadow. For example, ROM=C000–C7ff remaps only the 32K usually allocated for video memory. ■

Lenny Bailes is a DOS programmer and free-lance computer journalist in San Francisco.

SHAREWARE PICKS

Playing Favorites

Now the shareware programs we can't live without are available to you on an affordable disk exclusively from DOS World.

Over the years, *DOS World*'s editors have sought the best bargains in shareware utility software to help readers through their daily struggles with DOS. Each shareware program recommended in these pages is uploaded to *DOS World*'s BBS, but now six of the best are also available on a special $9.95 disk.

Our expert shareware picker is Contributing Editor Hardin Brothers, a 15-year veteran of computer journalism. Hardin also served for many years as review editor for *CompuServe* magazine.

The Favorite Shareware Utilities disk offers a combination of Hardin's own mainstays, plus the best programs recommended by readers in his "Shareware Exchange" column. The result is a collection of the only shareware programs that are so good they were worth writing about again. Look for the next disk in the series in an upcoming issue.

Boxer 6.0a

Just about everyone can use a good text editor, and if you own DOS 5 or later, you've got a fair one in EDIT. Serious programmers, however, usually need more control than EDIT provides, such as cut and paste and automatic indenting. Enter the text editors, one of the best of which is Boxer 6.0a from Boxer Software.

Boxer's rich list of features includes multilevel UNDO and REDO, through which the program keeps track of each change you make in a document. At a keystroke, you can tell Boxer to UNDO up to 4000 changes. If you accidentally UNDO something you wanted to keep, you can reverse that action with the equally simple REDO command.

Boxer also lets you load multiple files at once and edit them in separate windows. It includes powerful macro capabilities, context-sensitive on-line help, and both text and word-processing modes. In text mode, you must press Enter at the end of each line; in word-processing mode, Boxer performs word wraps automatically until you reach the end of a paragraph.

Numerous other features, including sorting, simple arithmetic functions, and the ability to reconfigure the keyboard and display, make Boxer a top-notch editor.

BackInfo 1.33

What do you do if your hard drive crashes *and* you lose information you need to get it running again, such as disk-partition data or CMOS parameters? You could try to rebuild the system piecemeal, or you could use a recovery disk created with BackInfo from Chief Data Recovery Ltd.

BackInfo is several programs in one. To use the first module, which saves vital information from your CMOS memory and hard drive, you format a new floppy disk with DOS's /S and /U options, then run BackInfo to store information on it. BackInfo saves a copy of your CONFIG.SYS and AUTOEXEC.BAT files; copies configuration data (such as the partition table) from your hard drive along with the computer's CMOS setup data; adds a text file containing a profile of your system; and copies its companion program, RestInfo. The program also transfers some essential DOS utilities. Total disk space: 500K.

When you use the rescue floppy to boot up your computer after a system crash, RestInfo checks the hard drive and CMOS data to make sure they match the recorded information. If not, it restores the system information for you.

BackInfo is well worth considering if you don't already own a DOS utility for creating a rescue disk.

DCopy Plus 2.0

If you often copy large groups of files from one floppy disk to another, you may be frustrated by the frequent disk swapping and limitations of DOS's COPY, XCOPY, and DISKCOPY commands. DCopy Plus 2.0 from Scott Abramowitz was created to smooth the disk-copying process.

One of DCopy Plus's nicest features is its ability to make multiple copies of a disk without rereading it each time. You simply place each blank disk in the drive at the appropriate time and press Enter. DCopy transfers the data from memory to the new disk.

You can also set the program either to format each target disk for you or to format disks not already formatted. If you don't format the target disk, DCopy Plus erases the data it contains by writing a new file-allocation table (FAT) and root directory before it starts transferring data. The program can also verify the integrity of each file as it copies it.

Best of all, DCopy Plus makes its copies in a single pass, even if you're copying from a drive to itself. It's a fast and simple program that makes disk swapping a thing of the past.

LCD 4.0B

The failings of the DOS CD (change directory) command are well known even to beginning users. Perhaps the worst is CD's inability to switch to a subdirectory without your listing the directory's full pathname.

LCD 4.0B (for *Ledbetter Change Directory*), from Keith Ledbetter, keeps track of pathnames for you by building a database of subdirectories. It lets you change directories by typing `LCD` followed by part of the directory name; you switch instantly to the new directory, on whatever drive it's located. If the directory name is ambiguous, a dialog box appears on screen, and you can choose the subdirectory you want.

You can also use LCD to create and delete subdirectories; the program will update its pathname directory accordingly.

LF (Locate File) 3.4

Finding lost files is a recurring problem for every DOS user, but two kinds of utilities can help. The first searches every subdirectory on your hard drive for the files you name, while the second searches within files for specific text.

LF 3.4, from William Pemberton, is a file finder of the first type. The latest version of this small program includes several new features. It can search for files by size and date, it can search multiple drives, and it can execute a command (including a batch file) for every file it finds with a matching name.

SnapShot 1.22

Sometimes you need a different kind of rescue disk from the close-to-the-metal backup created by BackInfo (page 51). Newly installed application programs may wreak havoc with configuration files such as AUTOEXEC.BAT and WIN.INI. K.R. Duncan's SnapShot 1.22 is designed to record such changes so that you can reconstruct your software setup if necessary.

Reader Dwight Hoyes praised SnapShot as extremely easy to use and intuitive. You run it before installing your application so that it can create a LOG file of your existing setup. Each successive time you run SnapShot, it lists any changes to your configuration in a text file. If you encounter a problem after an installation, you can replace the offending setup file with an older, working one saved by SnapShot.

One final word about shareware: If you like any of our Favorite Shareware Utilities enough to use them regularly, you're required to license each program according to the instructions outlined in the software's accompanying documentation or help screen. Fees for programs on this disk range from $15 and $50. ■

DOS TIP

AIN'T MISBEHAVIN'

Some poorly behaved programs have the bad habit of activating your video display's color border and not resetting it when you exit the program. Issuing a CLS command doesn't get rid of the problem, and in desperation some users reboot their computers. An easier way is to use the following MODE command to reset the video display to 80-character lines, clear the screen, and turn off the border:

```
MODE CON: COLS=80
```

If you routinely use a program that doesn't reset the border, you might want to use a batch file to call the program. Suppose, for example, that your troublesome program is named BADBRDR.EXE. The following two-line batch file, called BADBORD.BAT, puts an end to the bad-border blues:

```
BADBRDR.EXE
MODE CON: COLS=80
```

When you type `BADBORD`, the batch file invokes BADBRDR.EXE. When you exit the program, control returns to the batch file, the MODE command is executed, and the border disappears.

—Doug Lowe

DOS Challenge

TEST YOUR DOS IQ

Listen up, DOS buffs: Show us your stuff. Grab a No. 2 pencil and get ready to match wits with the author of the best-selling DOS for Dummies. *Take the "DOS Challenge" and test your brains, brawn, and programming skill against our tricks, trivia, and hardware know-how.*

by Dan Gookin

QUESTIONS

DOS Lore and Legend

1 Before DOS was known as "DOS," another computer had an operating system that was widely called DOS. Name it.

2 Who wrote the original version of DOS?

- **a)** Bill Gates
- **b)** Peter Norton
- **c)** Paul Allen
- **d)** Tim Patterson
- **e)** someone else

3 Which of the following "external" commands were included in DOS version 1.0?

- **a)** CHKDSK
- **b)** COMP
- **c)** DEBUG
- **d)** DISKCOPY
- **e)** EDLIN
- **f)** FORMAT
- **g)** DISKCOMP
- **h)** SYS

4 Which version of DOS had the shortest life span before the next version of DOS replaced it?

5 Name the DOS version that introduced each of the following features:

- **a)** subdirectories
- **b)** IBM PC/AT support
- **c)** DOS Shell
- **d)** 3.5-inch disk drives
- **e)** batch-file CALL command
- **f)** partitions larger than 32MB
- **g)** memory management

6 Which version of DOS appeared at the same time as OS/2 version 1.0 and the IBM PS/2 computer?

7 True or false: The MEM command was introduced with DOS 5.

Nuts & Bolts

1 Which runs first: CONFIG.SYS or AUTOEXEC.BAT?

2 Which runs first: CONFIG.SYS or COMMAND.COM?

3 Name the six DOS commands that have two names.

4 Name three CONFIG.SYS commands you can also use in AUTOEXEC.BAT or at the DOS prompt.

5 Name three DOS commands that display the message "XXXX is on" or "XXXX is off."

6 Name two common DOS commands (other than batch-file commands and filters) that never display any output on screen, not even error messages.

7 What are DOS's three filters (files that modify text), and what do they do?

8 Name DOS's five basic devices and the types of hardware those devices control.

9 True or false: The PRN and LPT1 devices are the same.

10 The differences between PC DOS and MS-DOS are subtle. (Well, before DOS version 6.0 they were, anyway.) But what was the one major command difference between the two operating systems (before DOS 6.0)?

11 Name the three legitimate commands (besides REM) you can put into CONFIG.SYS that do nothing to configure the computer.

12 Name the six DOS commands that have an /S option, meaning "include all subdirectories."

13 Which six DOS commands use the volume label?

Gotcha! ("The Stumpers")

1 Drive A is a 1.2MB floppy; B is a 1.4MB floppy. How would you create a logical drive that's a 720K floppy?

2 Formulate a DOS command line that displays the current date, but doesn't prompt for a new date, pause for user input, or display more than one line of text.

3 Write a batch file that saves the current directory in an environment variable named CURDIR.

Hot One-Liners

1 Write a one-line batch file that counts the number of files on the current disk.

2 Write a one-line batch file that examines the contents of the CONFIG environment variable and then runs a second batch file based on what it finds. Assume the CONFIG variable could contain any of these four possible values: MARY, JOHN, WINDOWS, NETWORK.

Bonus!

Send us your most complex DOS prompt. The most impressive submission will be published in an upcoming issue of *DOS World*. We'll be looking for creative ANSI commands, color, and animation.

How'd you do? For answers to questions in the first four sections, turn to page 74.

Dan Gookin is a contributing editor and columnist for DOS World. *He's also the author of numerous book on computing.*

QBASIC SUBROUTINES

Special-Effects Programming

Yes, you can have your fun and program, too. These four eye- and ear-catching subroutines make it easy.

by Dennis Mull and Tina Sweet

Good things come to those who program on vacation—at least that's the way we see it. We took along a laptop and spent an afternoon just sipping tea and punching keys.

The results of our "work" are the four attention-grabbing subroutines shown in the accompanying listing, FUNSUBS.BAS (page 56). The MARQUEEPAUSE section creates fancy borders that blink like the lights on a marquée sign; TICKPRINT and TICKERTAPE print messages on your screen; and DOSOUND lets you add sound effects to your programs.

To see how these subroutines work, run QBasic and begin typing in the program, starting with the DEFINT A–Z statement. (QBasic automatically adds the DECLARE statements later.) After completing a few lines, select the File menu's Save As option and name the program `FUNSUBS.BAS`.

After typing in the demo program's "The end" message and the subsequent END statement, save your work again. You've reached the end of the main program.

To create each subroutine, select the New Sub option from the Edit menu and assign it the name shown in the listing. QBasic adds DEFSNG statements where necessary, fills in the first part of the first line of the SUB statement, and supplies the last line of the subprogram. You type the lines in between. When you save the main program, QBasic saves the subprogram along with it, adding the proper DECLARE statements at the top of the main program. Save your work one last time.

To see what the subroutines can do, press Shift+F5 or choose the Run menu's Start option. (Note that if you don't have the time or the inclination to type in the listing, you may download FUNSUBS.BAS from the *DOS World* BBS at 603-924-3181.)

Look and Listen

FUNSUBS.BAS puts MARQUEEPAUSE through its paces first. To keep things simple, the program displays a short message surrounded by a border composed of asterisks. The routine turns on each of the asterisks in the border in sequence and then turns each one off, just as the light bulbs in a marquée switch on and off. You may substitute another character for the asterisk by changing the value of the variable CH%. (See the table "Program Variables," right.) For example, to use a "happy face" in the marquée's border, alter the variable's value by changing CH=42 to CH=1, the ASCII value for the happy-face symbol.

Use MARQUEEPAUSE to print a border anywhere on screen simply by assigning the proper values to the QBasic variables you pass to the subprogram as parameters.

Suppose you want to display the following message for five seconds at the start of your program:

```
Copyright Dennis Mull & Tina Sweet
Version 1.1
All rights reserved.
```

To clear the screen and place the message in row 11, column 23,

---

Programmers Dennis Mull and Tina Sweet are the owners of D&T Soft Computer Service, a company specializing in installing and troubleshooting computer systems.

PROGRAM VARIABLES

VARIABLE	RANGE OF VALUES	DESCRIPTION
BKCLR%	0–15	background color
CH%	1; 33–254	ASCII value of character used in marquée border
CHCLR%	1–15	foreground color
COL%	1–78	column to begin printing
DELAY!	1–100	length of delay to adjust scrolling or printing speed
HIGH%	1–23	height of border
HOWMANY%	1–100	number of times to sound
MESSAGE$	1–79	message to print
ROW%	1–25	row to begin printing
SND%	0 or 1	turn sound off (0) and on (1)
TOUT!	1–100	elapsed time (in seconds) before MARQUEEPAUSE ends
WHICHSND%	1–4	number of CASE statement for desired sound
WIDE%	2–16	width of marquée border

you'd start by adding a CLS statement and three LOCATE statements:

```
CLS
LOCATE 11, 23, 0: PRINT "Copyright
  Dennis Mull & Tina Sweet"
LOCATE 12, 23, 0: PRINT "Version
  1.1"
LOCATE 13, 23, 0: PRINT "All
  rights reserved."
```

You'd then set the values for MARQUEEPAUSE and call the subroutine:

```
CH% = 42: BKCLR% = 14: CHCLR% =
  14: ROW% = 9
COL% = 12: WIDE% = 55: HIGH% =
  6: TOUT! = 5
MARQUEEPAUSE CH%, BKCLR%,
  CHCLR%, ROW%, COL%, WIDE%,
  HIGH%, TOUT!
```

TICKPRINT and TICKERTAPE are variations on a theme. The former displays a message in the center of the screen, printing it one character at a time from left to right, sounding a single "typewriter click" as each character is printed, clearing the screen, and starting over again. TICKERTAPE displays a message that scrolls its way from left to right, simultaneously sounding a click as each character appears. The message disappears when you press a key.

You might use these routines in different ways—perhaps to focus attention on a short menu, a help screen, or a message to remind users that they must type something before the program can continue.

As written, TICKPRINT and TICKERTAPE display yellow text on a black screen, but you can vary this by changing the values of CHCLR% and BKCLR%, the variables that control foreground and background color. (See the accompanying table "Color Values," below.)

For example, color-code your messages, displaying error messages in red text on a white background and help messages in white text on a blue background. To set up the first color scheme under TICKPRINT, you'd change this line:

```
TICKPRINT MESSAGE$, 12, 26, 5, 1,
  0, 14
```

to read as follows:

Text continues on page 58

COLOR VALUES

NUMBER	COLOR	NUMBER	COLOR
0*	black	8	dark gray
1	blue	9	light blue
2	green	10	light green
3	cyan	11	light cyan
4	red	12	light red
5	magenta	13	light magenta
6	brown	14	yellow
7	white	15	bright white

*In the version of TICKPRINT provided here, selecting a value of zero for a foreground color tells the routine to display text in a rainbow of colors.

The demonstration program FUNSUBS.BAS includes four subroutines you may use to enliven your own QBasic programs: MARQUEEPAUSE, TICKPRINT, TICKERTAPE, and DOSOUND.

```
DECLARE SUB MARQUEEPAUSE (CH%, BKCLR%, CHCLR%,
  ROW%, COL%, WIDE%, HIGH%, TOUT!)
DECLARE SUB TICKPRINT (MESSAGE$, ROW%, COL%,
  DELAY!, SND%, BKCLR%, CHCLR%)
DECLARE SUB TICKERTAPE (MESSAGE$, ROW%, DELAY!,
  SND%, BKCLR%, CHCLR%)
DECLARE SUB DOSOUND (WHICHSND%, HOWMANY%)
DEFINT A-Z
 '----- Demo Program ------'
 CH% = 42            'Use any number from 33 to 254
 CHCLR% = 15         'Foreground (text) color value,
                     'use 0 to 15
 BKCLR% = 0          'Background color number,
                     'use 0 to 15
 WIDE% = 45          'Width of marquee, use 5 to 78
 ROW% = 19           'Starting row, use 1 to 23
 COL% = 17           'Starting column, use 1 to 78
 HIGH% = 2           'Border height, use 1 to 23
 TOUT! = 5           'Time-out value,
                     'use 1 to ? seconds

 CLS
 LOCATE 20, 24: PRINT "Press any key
   to exit the marquee."
 MARQUEEPAUSE CH%, BKCLR%, CHCLR%, ROW%, COL%,
   WIDE%, HIGH%, TOUT!
 CLS : MESSAGE$ = "Press any key to exit."
 TICKPRINT MESSAGE$, 12, 26, 5, 1, 0, 14

 CLS
 LOCATE 12, 35, 0: PRINT "Whistle"
 DOSOUND 1, 5: SLEEP 1
 LOCATE 12, 35: PRINT "Bomb drop "
 DOSOUND 2, 1: SLEEP 1
 LOCATE 12, 35: PRINT "Bee bop   "
 DOSOUND 3, 3: SLEEP 1
 LOCATE 12, 35: PRINT "Siren    ";
 DOSOUND 4, 3: SLEEP 1
 LOCATE 12, 35: PRINT "         "

 CLS
 MESSAGE$ = "Press any key to exit.   **** This is
   a simple ticker-tape program. ****"
 TICKERTAPE MESSAGE$, 25, 6, 40, 0, 14
 LOCATE 11, 35: PRINT "The End!"
END

DEFSNG A-Z
SUB DOSOUND (WHICHSND%, HOWMANY%) STATIC
 REPEAT% = 0
DO
 SELECT CASE WHICHSND%
  CASE 1
   FOR N = 900 TO 1500 STEP 8          'Whistle
   SOUND N, .1
   NEXT N
  CASE 2                               'Bomb drop
   FOR N = 1900 TO 100 STEP -5
    SOUND N, .1
   NEXT N
  CASE 3                               'Beebop
   SOUND 500, 1
   LOOPS = 6
   TIN! = TIMER
   WHILE TIMER < (TIN! + LOOPS) / 100: WEND
   SOUND 1000, 1
   WHILE TIMER < (TIN! + LOOPS) / 100: WEND
  CASE 4                               'Siren
   SOUND 1700, 5
   SOUND 1000, 5
 END SELECT
 REPEAT% = REPEAT% + 1
LOOP WHILE REPEAT% < HOWMANY%
END SUB

SUB MARQUEEPAUSE (CH%, BKCLR%, CHCLR%, ROW%, COL%,
  WIDE%, HIGH%, TOUT!) STATIC

 COLOR CHCLR%, BKCLR%           'Set character color.
 CHAR$ = CHR$(CH%)
 IF WIDE% > 80 THEN WIDE% = 79

 IF WIDE% > 1 THEN
  WIDE% = (WIDE% / 5) + 1
 END IF

 LESS% = 5: W% = 4
 IF WIDE% >= 15 THEN
  LESS% = -1
  W% = 5
 END IF

 IF HIGH% > 25 THEN HIGH% = 24     'Check for
                                   'out-of-range
                                   'values
 IF ROW% > 25 THEN
  ROW% = 25 - HIGH%
 END IF
 IF ROW% + HIGH% > 25 THEN
  ROW% = 25 - HIGH%
 END IF

 IF CHAR$ = "" THEN CHAR$ = "*"
 CHAR$ = CHAR$ + SPACE$(W%)
 TOP% = ROW%: BOTTOM% = ROW% + HIGH%

 FOR I = 1 TO WIDE%           'Create character bars.
  TOPCHAR$ = CHAR$ + TOPCHAR$
 NEXT I
 CHAR$ = TOPCHAR$

 LENGTH% = LEN(CHAR$)        'Check bar length.
 IF LENGTH% > 79 THEN LENGTH% = 78

 IF LENGTH% < 79 THEN
  IF COL% + LENGTH% > 78 THEN
  COL% = (78 - LENGTH%) + 3
  END IF
 END IF
 IF LENGTH% = 78 THEN COL% = 1
 TIN! = TIMER
 TOUT! = TIMER + TOUT!

 DO                                'Break out
                                   'on key press.
 FOR X = 1 TO 5                    'Begin printing loop
                                   'for border.
  TIN! = TIMER
```

```
   WHILE TIMER < TIN! + .008: WEND   'Control
                                     'light speed.
   LOCATE TOP%, COL%, 0
   PRINT MID$(RTRIM$(CHAR$), X, 80); 'Print
                                     'horizontal
                                     'bars
   LOCATE TOP%, COL% + (WIDE% * 5) - 6, 0
   PRINT " "
   LOCATE TOP%, COL% + (WIDE% * 5) - 8, 0
   PRINT " "
   LOCATE BOTTOM%, COL%, 0
   PRINT MID$(RTRIM$(CHAR$), 6 - X, 80);
  FOR B = ROW% TO BOTTOM%            'Print
                                     'vertical
                                     'bars.
   C = (X + B) MOD 2
   IF C = 1 THEN
    LOCATE B, COL%, 0
    PRINT LEFT$(CHAR$, 1);
    LOCATE B, (LENGTH% - LESS%) + COL%, 0
    PRINT LEFT$(CHAR$, 1);
   ELSE
    LOCATE B, COL%, 0
    PRINT " ";
    LOCATE B, (LENGTH% - LESS%) + COL%, 0
   PRINT " ";
    END IF
  NEXT B
 NEXT X
  KEY$ = "": KEY$ = INKEY$
  IF TIMER > TOUT! THEN EXIT DO  'Drop out
                                 'when TIMER=TOUT!
  LOOP WHILE KEY$ = "":
  COLOR 7, 0
  CLS

END SUB

SUB TICKERTAPE (MESSAGE$, ROW%, DELAY!, SND%,
  BKCLR%, CHCLR%) STATIC

  SPAC% = 80 - TAPELEN%                 'Find spaces
                                        'needed.
  MESSAGE$ = STRING$(SPAC%, 32) + MESSAGE$ 'Add
                                           'those
                                        'spaces to
                                        'MESSAGE$.
  TAPELEN% = LEN(MESSAGE$)        'Assign length to
                                  'TAPELEN%.
  COLOR CHCLR%, BKCLR%
DO
 FOR TAP% = TAPELEN% TO 1 STEP -1  'Print MESSAGE$
                                   'starting at
                                   'the end.
  LOCATE ROW%, 1, 0                'Start printing
                                   'MESSAGE$ here.
  IF EXPAND% < 80 THEN EXPAND% = EXPAND% + 1 'Advance
                                         'position
                                         'counter.
  PRINT MID$(Message$, TAP%, EXPAND%);   'Print
                                        'MESSAGE$.
  KEY$ = INKEY$: IF KEY$ <> "" THEN EXIT DO 'Check
                                            'for a
                                       'key press.
  TIN! = TIMER
  WHILE TIMER < TIN! + DELAY! / 100: WEND  'Timing
                                           'loop.
  IF SND% THEN SOUND 200, .1           'Make ticking
                                       'sound.

  IF CHCLR% = 0 THEN                   'If set to
                                       'zero, then
   IF COLR% < 13 THEN                  'make it
                                       'print in
    COLR% = COLR% + 1                  'colors.
    COLOR COLR% + 2, 0                 'Increment
                                       'color value.
   ELSE COLR% = 0                    'Reset to zero.
   END IF
  END IF

 NEXT TAP%
LOOP

  COLOR 15, 0
END SUB

DEFINT A-Z
SUB TICKPRINT (MESSAGE$, ROW%, COL%, DELAY!, SND%,
  BKCLR%, CHCLR%) STATIC
  DEFSNG A-Z

  COLOR CHCLR%, BKCLR%

  IF COL% + LEN(MESSAGE$) >= 79 THEN     'Check for
                                         'column
                                         'position.
   COL% = 79 - LEN(MESSAGE$)           'If too long,
                                       'reset COL%.
  END IF
 DO
  LOCATE ROW%, COL%, 0
  PRINT SPACE$(LEN(MESSAGE$)) + " "
  FOR T = 1 TO LEN(MESSAGE$)         'Print message,
                                     'left to right.
  IF CHCLR% = 0 THEN                 'If character
                                     'color is zero,
  IF DOC% < 15 THEN DOC% = DOC% + 1  'print in 15
                                       'different
                                       'colors.
   COLOR DOC%, BKCLR%
   IF DOC% = 15 THEN DOC% = 0
  END IF
  LOCATE ROW%, COL% + T
  PRINT MID$(MESSAGE$, T, 1)
  TIN! = TIMER
  WHILE TIMER < TIN! + (DELAY! / 100): WEND 'Timing
                                           'loop.
  IF SND% THEN
   IF MID$(MESSAGE$, T, 1) <> " " THEN
    SOUND 500, .1                       'If SND%=1,
                                        'make sound.
   END IF
  END IF
  KEY$ = INKEY$: IF KEY$ <> "" THEN EXIT DO 'Check
                                            'for a
                                       'key press.
 NEXT T
  SLEEP 1
  LOCATE , , 1                 'Turn cursor back on.
 LOOP
 COLOR 15, 0
END SUB
```

End

DOS TIP

GATHER YE TEXT FILES

I wrote GATHER.BAT to help me in my work as a technical writer; perhaps you'll find it handy, too. It lets you rapidly combine and view the contents of ASCII text files with similar file extensions—those with TXT, BAT, and DOC extensions, for example.

The program has only one limitation: You can't use it to combine certain files, as you can using the COPY command with its + parameter (COPY *file1.ext + file2.ext newname.ext*). You may gather all files in a directory using DOS wildcard sequences, such as *.* and *.???, however.

GATHER.BAT requires two parameters. The first is a file specification, such as *.BAT. You may include a pathname, as in C:\PW\*.BAT. The second parameter is a target filename, such as BIGFILE.TXT, which may also include a path. If you type GATHER without any parameters, a help screen appears.

After GATHER.BAT creates the combined file, it presents a menu from which to choose an item. Press 1 to display the file on screen, press 2 to send the file to your printer, or press 3 to exit the program and return to the DOS prompt.

—John Wolfskill

GATHER.BAT lets you combine two or more text files into a single file.

```
@ECHO OFF
IF "%1" =="" GOTO HELP
IF "%2" =="" GOTO HELP
IF NOT EXIST %2 GOTO GOODFILE
CHOICE OVERWRITE EXISTING %2
IF ERRORLEVEL 2 GOTO ENDIT
DEL %2 > NUL
:GOODFILE
FOR %%A IN (%1) DO TYPE %%A >> %2
ECHO %2 has been created
ECHO ------------------------------------
ECHO [1] View the file
ECHO [2] Print the file
ECHO [3] Exit to the DOS prompt
ECHO ------------------------------------
CHOICE /C:123
IF ERRORLEVEL 3 GOTO ENDIT
IF ERRORLEVEL 2 GOTO PRINTIT
IF ERRORLEVEL 1 GOTO TYPEIT
:PRINTIT
ECHO -- Place printer on line --
PAUSE
COPY %2 PRN:
GOTO ENDIT
:TYPEIT
TYPE %2 | MORE
GOTO ENDIT
:HELP
ECHO ------------------------------
ECHO Syntax: GATHER [d:\]filespec.ext [d:\]
ECHO targetfile.ext, where [d:\] is the path;
ECHO filespec.ext is a wildcard sequence, such as
ECHO *.DOC; and [d:\] targetfile.ext is the path and
ECHO filename of the composite file.
ECHO ------------------------------
:ENDIT
```

End

```
TICKPRINT MESSAGE$, 12, 26, 5, 1,
  7, 4
```

To use the second color scheme with TICKERTAPE, you'd change this line:

```
TICKERTAPE MESSAGE$, 25, 6, 40, 0, 14
```

to read:

```
TICKERTAPE MESSAGE$, 25, 6, 40, 1, 7
```

When you call TICKPRINT and use a value of zero for BKCLR%, the subroutine uses black as the background color, as you'd expect. When you set CHCLR% to zero, however, your message appears in a rainbow of colors.

If you don't like that effect and would prefer black as a text color, disable this feature by deleting the following lines from TICKPRINT:

```
IF CHCLR% = 0 THEN
IF DOC% < 15 THEN DOC% = DOC% + 1
 COLOR DOC%, BKCLR%
 IF DOC% = 15 THEN DOC% = 0
END IF
```

Whistle While You Work

Ticking isn't the only "music" FUNSUBS.BAS lets you make. The program's fourth subroutine, DOSOUND, demonstrates how to add whistles, bomb drops, beebops, and a siren to any message. These sounds have many uses: For example, imagine using a bomb drop or a siren to accompany an error message. Users would know right away that something had gone wrong.

You choose a sound by initializing the parameter variable WHICHSND%, using a number from 1 to 4. The numbers correspond to those given in the CASE statement for each sound.

You may also tell DOSOUND how many times you want it to make the sound by initializing the variable HOWMANY%, using a value from 1 to 100.

Another option is to use DOSOUND within a DO...LOOP construction. In the following example, for instance, the sound will continue until the user presses a key:

```
WHICHSND% = 1: HOWMANY% = 1
DO
  DOSOUND WHICHSND%, HOWMANY%
  A$ = "": A$ = INKEY$
LOOP WHILE A$ = ""
```

To add sounds to DOSOUND, load FUNSUBS.BAS at the DOS prompt:

```
QBASIC FUNSUBS.BAS
```

(QBasic must be in the current directory or in a directory listed in your AUTOEXEC.BAT's PATH statement.) When you press the F2 key, QBasic will display a list of the subroutines in FUNSUBS.BAS. Highlight the subroutine DOSOUND and press Enter. When QBasic displays DOSOUND, use the down-arrow key to move the cursor to the line that reads END SELECT, then press Enter. Type the code for the new sound in the blank space you created. For example, if you want to add a snippet of arcade "music" to your sound repertoire, insert these lines:

```
CASE 5
   FOR X = 1 TO 20 STEP 2
    SOUND 150 * X, .7
   NEXT X
   FOR X = 30 TO 1 STEP -2
    SOUND 50 * X, .7
   NEXT X
```

Save your work. Press F2 and Enter to switch back to the program's main module. Move the cursor down to this statement:

```
LOCATE 12, 35: PRINT "        "
```

and press Enter again. Insert the following line into the listing:

```
DOSOUND 5, 1: SLEEP 1
```

To test the new sound, press Shift+F5 to run the program again.

In Your Court

We've had our fun; now it's your turn. We're confident you can dream up many uses for these versatile subroutines.

And the best part is that you won't have to do much typing to incorporate our ideas into your code, because we've written a short program, LIB.BAS, which merges FUNSUBS.BAS with another QBasic program.

After typing in the accompanying listing (below), save your work, then press Shift+F5 to run it. LIB.BAS asks you to type the name of the program to which you want to add FUNSUBS.BAS. (If that program isn't in the same directory as QBASIC.EXE, you may include a directory name.)

When you press Enter, LIB.BAS creates a file named TEMP.BAS. Save this file right away under a different name to avoid overwriting it the next time you use LIB.BAS. (You may use the name of the program to which you're adding FUNSUBS.BAS, which overwrites the old version of that program, or choose a new filename.)

After adding FUNSUBS.BAS to another program, delete the sections of FUNSUBS.BAS you don't need. First, press F2 to see a list, then highlight the name of the subroutine to delete and press Alt+D. Delete any other routines you don't need, then press F2 and Enter to return to the main module. Finally, delete the appropriate DECLARE statements.

If you're writing a program from scratch, simply load FUNSUBS.BAS and save it under a different name. That way, you'll always have the original version of the program.

To keep the fun alive, though, you might want to take the added precaution of storing a backup copy of FUNSUBS.BAS in a safe place. ■

Use LIB.BAS to merge the routines in FUNSUBS.BAS with other QBasic listings.

```
DIM SHARED FUN$(300)
CLS
INPUT "Your program name:", YOUR$   'Ask for the name
                                    'of the program.

  OPEN "I", #1, "FUNSUBS.BAS"       'Open FUNSUBS.BAS for reading.
  OPEN "I", #2, YOUR$               'Open your program for reading.
  OPEN "O", #3, "TEMP.BAS"          'Temporary file
                                    'made by LIB.BAS.
  DO
   X = X + 1
   LINE INPUT #1, FUN$(X)           'Load FUNSUBS.BAS in an array.
   IF X < 5 THEN PRINT #3, FUN$(X)  'Add FUNSUBS declarations
                                    'to TEMP.BAS.
  LOOP WHILE NOT EOF(1)
   CLOSE #1                         'Close FUNSUBS.BAS file.
  DO
   LINE INPUT #2, YUR$              'Read your program file.
   PRINT #3, YUR$                   'Add your program lines
                                    'to TEMP.BAS
  LOOP WHILE NOT EOF(2)             'Stop when last line is read.

  FOR F = 5 TO 200
   IF INSTR(FUN$(F), "SUB ") = 1 THEN OK = 1
   IF OK THEN PRINT #3, FUN$(F)      'Add subroutines to TEMP.BAS.
  NEXT F
  CLOSE #2, #3                      'Close files.
  CLS : BEEP: LOCATE 11, 1, 0
  PRINT "Job Complete. Load TEMP.BAS into QBasic
    and save it under a different name."
END
```

End

DOS WORLD

Readers' Queue

Easy on the Eyes

When you need to display text during the execution of a batch file, you have several options. Unfortunately, the most common method, using the ECHO command, is slow and doesn't produce professional-looking results. Using the TYPE command speeds things up a bit, but the results are even less attractive than those achieved with ECHO.

I prefer a third method: creating text screens that are small programs. Not only does this approach let you display text almost immediately, but it also produces better-looking screens. To create executable screens, I developed a program called SCREEN.BAS (see facing page). You may run the program in QBasic or compile the code with Visual Basic for DOS or QuickBasic 4.0 or later. (To run the QBasic program from anywhere on your hard drive, make sure both QBASIC.EXE and SCREEN.BAS are in a subdirectory listed in your AUTOEXEC.BAT's PATH statement).

When you run the program, it asks you to type the name of the screen you want to create. Supply a legal filename; if you forget to include an extension or use something other than COM, the program corrects your error. If you press Enter, SCREEN.BAS uses the default filename, SCREEN.COM.

If the filename you enter is too long, an error message is displayed, and you must retype the name. Be careful, though; if you use a filename that already exists, SCREEN.BAS overwrites the original file.

Next, the program asks you to type as many as 24 lines of text, each of which may contain as many as 80 characters. If you exceed that limit, only the first 80 characters are included in the screen program. You may not use a dollar sign ($), but you may include any other printable characters, including extended characters such as box-drawing characters. (A dollar sign causes problems because DOS interprets it as an end-of-string marker when executing the screen program.) To produce a blank line, simply press the spacebar once and press Enter.

When you complete each line, the program asks whether to center, left-justify (start text at the left margin), or right-justify the text you supplied. Press `C` to center text, `R` to make it right-justified, or `L` to make it left-justified. Press Enter.

To indicate that you've reached the end of your screen message, press Enter (without pressing the spacebar). When you do this, SCREEN.BAS creates the executable screen and asks whether you want to create another one. Press `Y` to create another screen, or `N` to end the program.

To put your screen programs to work in a batch file, simply call them as you would any other QBasic program.

For instance, if you created a warning screen, called WARNING.COM, that lets the user know whether a file of a particular name already exists, you might use the following lines in your batch file:

```
IF EXIST %1 GOTO ITSTHERE
.
.place other commands here
.
:ITSTHERE
WARNING
```

SCREEN.BAS certainly offers an improvement over ECHO and TYPE, but it isn't perfect. It doesn't let you specify colors or include more than 24 lines of text, for example. Under most circumstances, these shortcomings aren't serious.

Vincent D. O'Connor
Babbitt, Minn.

DOS TIP

PUTTING THE SQUEEZE ON

If you have MS-DOS 6.0 or later, you may be able to use MemMaker to free up a bit more conventional memory for your applications. If your system has an EGA or later video adapter, answer yes to MemMaker's "Use monochrome region (B000–B7FF) for running programs?" prompt. This frees up 32K of upper memory. To scan the F00 memory segment for an additional 32K of RAM, also answer yes to the "Scan upper memory aggressively?" prompt.

Note that these MemMaker options don't always work, though. In rare circumstances, conflicts with DOS programs may arise.

—Paulo A. Shakarian

Subprograms Save Time

Well-constructed programs should include attractive screen displays and a good user interface. The trouble is, writing procedures to handle these tasks often forces you to focus your attention on ancillary matters rather than on the main program. To avoid spending precious programming time on secondary code, I wrote TEMPLATE.BAS (page 62), a QBasic program that includes four subprograms: a routine for drawing a box, one for temporarily halting a program, another for sounding a beep, and a fourth for displaying text in the center of a row.

The subprogram DRAWBOX colors the screen and places a shaded text box of any size or color anywhere on the display. You may change the size, location, and color of screen elements at any point in the program, by calling DRAWBOX and varying the values of its parameters. PAUSE suspends program execution for the requested period of time. BEEPER lets you alert the user to an event—perhaps to indicate that he or she pressed an incorrect key, for example. CENTEXT lets you center a message on any row on screen.

To insert one of the subprograms into a program that needs that par-

SCREEN.BAS provides an alternative to the ECHO command, letting you create short text programs that you may execute within a batch file.

```
DEFINT A-Z
CONST FALSE = 0
CONST TRUE = NOT FALSE
DIM CODE$(9), LINES$(24)
CODE$(1) = CHR$(186): CODE$(2) = CHR$(9):
  CODE$(3) = CHR$(1)
CODE$(4) = CHR$(180): CODE$(5) = CHR$(9):
  CODE$(6) = CHR$(205)
CODE$(7) = CHR$(33):  CODE$(8) = CHR$(205):
  CODE$(9) = CHR$(32)

CLS
MESSAGE$ = "QBasic Batch File Screen Maker"
LOCATE 1, 41 - INT(LEN(MESSAGE$) / 2)
PRINT MESSAGE$;
PRINT STRING$(80, 196)
VIEW PRINT 3 TO 24
START:
SCRNNAME$ = ""
LINES = 1
GOODNAME = FALSE
DO WHILE NOT GOODNAME
   CLS : LOCATE 6, 1
   LINE INPUT "Screen Name: "; SCRNNAME$
   IF "" = SCRNNAME$ THEN SCRNNAME$ =
     "SCREEN.COM"
   SCRNNAME$ = UCASE$(SCRNNAME$)
   DOT = INSTR(SCRNNAME$, ".")
   IF NOT DOT THEN
      SCRNNAME$ = SCRNNAME$ + ".COM"
      DOT = INSTR(SCRNNAME$, ".")
   END IF
   IF MID$(SCRNNAME$, DOT) <> ".COM" THEN
      SCRNNAME$ = MID$(SCRNNAME$, 1, DOT - 1) +
        ".COM"
   END IF
   IF LEN(SCRNNAME$) > 12 THEN
      BEEP: PRINT : PRINT
      PRINT "Error! Screen name is too long!
        Press any key to continue..."
      WHILE INKEY$ = "": WEND
   ELSE
      GOODNAME = TRUE
   END IF
LOOP
DO WHILE LINES < 25
   CLS : LOCATE 6, 1
   PRINT "Enter line # " + LTRIM$(STR$(Lines)) +
     " or press Enter to end."
   LOCATE 8, 1: PRINT "=>";
   LINE INPUT LINE$(LINES)
   IF "" = LINE$(LINES) THEN
      LINES = LINES - 1
      EXIT DO
   END IF
   IF LEN(LINE$(LINES)) > 80 THEN
      LINE$(LINES) = LEFT$(LINE$(LINES), 80)
   END IF
   LENGTH = LEN(LINE$(LINES))
   IF "" <> RTRIM$(LINE$(LINES)) THEN
      PRINT : PRINT "(C)enter, (R)ight-justify,
        or (L)eft-justify line: ";
      DO
         CHOICE$ = UCASE$(INPUT$(1))
      LOOP WHILE INSTR("CRL", CHOICE$) < 1
      SELECT CASE CHOICE$
         CASE "C"
           LINE$(LINES) = STRING$(40 -
             INT(LENGTH / 2), 32) + LINE$(LINES)
         CASE "R"
            LINE$(LINES) = STRING$(80 - LENGTH,
              32) + LINE$(LINES)
      END SELECT
   END IF
   LINE$(LINES) = LINE$(LINES) + CHR$(10) +
     CHR$(13)
   LINES = LINES + 1
LOOP
IF LINES > 24 THEN LINES = 24
OPEN SCRNNAME$ FOR OUTPUT AS #1
FOR I = 1 TO 9: PRINT #1, CODE$(I); : NEXT
FOR I = 1 TO LINES: PRINT #1, LINE$(I); : NEXT
PRINT #1, CHR$(36): CLOSE #1
CLS : LOCATE 12, 1
PRINT "Create another screen (Y/N): ";
DO
   CHOICE$ = UCASE$(INPUT$(1))
LOOP WHILE INSTR("YN", CHOICE$) < 1
IF CHOICE$ = "Y" THEN GOTO START
VIEW PRINT: CLS : SYSTEM
```

End

ticular feature, use QBasic's editor to copy the example to the spot you want. At the appropriate point in your program, add a command to "activate" the subprogram. The four comment statements near the top of TEMPLATE.BAS show the correct syntax for calling each subprogram.

DRAWBOX features seven parameters. LR% indicates the row of the upper-left corner of the box, and LC% represents its column location; RR% indicates the row location of the lower-right corner of the box, and RC% is its column location. SC% controls the background screen color; FC% controls the foreground color of the text box; and BC% controls the color of the text box.

TEMPLATE.BAS contains reusable routines for drawing boxes, temporarily halting program execution, sounding a beep, and centering a row of text. For instructions on creating the listing's special characters, see "Drawing Boxes," page 41. (Note that the wide block is made up of two of the narrower blocks [ASCII 219] put together.)

```
'TEMPLATE.BAS

DECLARE SUB DRAWBOX (LR%, LC%, RR%, RC%, SC%, FC%, BC%)
DECLARE SUB PAUSE (DELAY!)
DECLARE SUB BEEPER ()
DECLARE SUB CENTEXT (ROW%, TEXT$)

'DRAWBOX 10, 15, 16, 65, 1, 0, 11
'CENTEXT 13, "This text is will be centered in row 13."
'PAUSE 1.9
'BEEPER

SUB BEEPER
  PLAY "o3L20af"
END SUB

SUB CENTEXT (ROW%, TEXT$)
  LOCATE ROW%, 40 - LEN(TEXT$) / 2
  PRINT TEXT$
END SUB

SUB DRAWBOX (LR%, LC%, RR%, RC%, SC%, FC%, BC%)

  COLOR , SC%
  CLS
  COLOR FC%, BC%

  LOCATE LR%, LC%: PRINT " ";  "╔"; STRING$(RC% - LC%, "="); "╗"
  LOCATE RR%, LC%: PRINT " ";  "╚"; STRING$(RC% - LC%, "="); "╝"

  FOR SIDES% = LR% TO RR% - 2
    LOCATE SIDES% + 1, LC%: PRINT " ║"; SPACE$(RC% - LC%); "║ "
  NEXT SIDES%

  FOR SHADE% = LR% TO RR%
    LOCATE SHADE% + 1, RC% + 4: PRINT "██"
  NEXT

  LOCATE RR% + 1, LC% + 2: PRINT STRING$(RC% - LC% + 2, "█")

END SUB

SUB PAUSE (DELAY!)

  PAUSED# = TIMER
  DO
    TRASH$ = INKEY$
    TRASH$ = ""
  LOOP UNTIL TIMER > PAUSED# + DELAY!

END SUB
```

End

For example, the sequence DRAWBOX 10, 15, 16, 65, 1, 0, 11 draws a cyan box, on a blue screen, positioning the upper-left corner at location 10, 15 and the lower-right corner at location 16, 65. The border of the box and the shading around it are black. If you use an unacceptable location or color, you receive an error message.

PAUSE includes only one parameter: the amount of time, in seconds, for which you want to suspend your program. You may use decimal values, such as 12.25. Suppose, for instance, that you want the user to read a shareware message for 60 seconds. Inserting the command PAUSE 60 into the program accomplishes this. (The lines containing the variable TRASH$ eliminate any keystrokes the user may enter while waiting for execution to resume.)

BEEPER replaces the BEEP statement and produces a less irritating tone. It has no parameters. To modify the sound, try experimenting with the subprogram's PLAY statement. (QBasic's on-line help provides details.)

CENTEXT has two parameters: ROW% and TEXT$. The former indicates the row on which you want to display your text; the latter is the text you want in that row. If you issue the command CENTEXT 13, "THIS TEXT WILL BE CENTERED IN ROW 13.", for example, the text in quotes is centered within the screen's 13th row.

I save a great deal of time with TEMPLATE.BAS. Whenever I need one of these routines, I don't have to write it again and again—it's right at my fingertips.

Tim Syrop
Carlin, Nev.

START-UP CLINIC

Shell Games And Memory Mischief

by Jack Nimersheim

Give our readers credit—they keep pushing DOS to its limits. Unfortunately, where DOS is concerned, push can easily come to shove. You push DOS, and it shoves you into a corner.

Sometimes the difficulty lies within DOS itself. More frequently, a conflict surfaces because DOS must manage the mishmash of so-called hardware "standards" that have evolved over the past decade and a half. This month's "Start-Up Clinic" questions deal with problems of both types.

> *Sometimes DOS is the problem, but often a conflict surfaces because DOS has to manage the mishmash of so-called hardware "standards" that have evolved over time.*

Outsmarting DOSSHELL

After accidentally activating the Select Across Directories option in the DOS Shell, I ended up deleting files from other directories I still needed. It took me quite some time—and several lost files—to discover and correct my mistake. Can I disable this command so that I can't select it from the Options menu?

Carl P. Borowicz
Colden, N.Y.

I had a lot of fun trying to find an easy way to solve your dilemma. I'd like to say I succeeded, but I didn't. Here's why.

Each time you quit the DOS Shell and return to the system prompt, the Shell saves its current settings automatically in a file called DOSSHELL.INI. Knowing this, I first tried using the ATTRIB command to make DOSSHELL.INI a read-only file. Normally, making a file read-only prevents DOS from overwriting it, which means that this change should have prevented the default settings stored in DOSSHELL.INI from being altered, even if I modified them while working in the DOS Shell. Unfortunately, in this instance, DOS doesn't follow its usual procedures. Although I designated the file read-only, DOS updated DOSSHELL.INI whenever I quit the DOS Shell.

Okay, I thought, I'll try a second approach. This time, I used the DOS editor, EDIT.COM, to call up the DOSSHELL.INI file and append a remark (REM) statement to the beginning of the line that reads CROSSDIRSELECTION = ENABLED, the setting saved when you turn on the Select Across Directories option. My hope was that DOS would get lost, figuratively speaking, and, being unable to identify this setting, would also be unable to update it. Unfortunately, again, DOS worked around my workaround. It simply created in DOSSHELL.INI a new line containing the CROSSDIRSELECTION setting, ignoring completely the line I had remarked out.

Clearly, Microsoft has built into DOS several safeguards to prevent users from corrupting their DOSSHELL.INI files accidentally. The downside of this, as you and I both discovered, is that you can't prevent an oversight from creating potentially damaging situations in your DOS Shell environment—unless you really outsmart DOS.

As I stated earlier, my original goal was to find an easy solution to your problem. Having failed in that effort, let me offer a more creative, but admittedly less elegant, approach.

First, configure the DOS Shell exactly as you want it, being sure to turn off the Select Across Directories option. Next, exit the Shell so that DOS saves your settings to DOSSHELL.INI. Then, use the COPY command to copy the current contents of DOSSHELL.INI to a file called SHELLCFG.HLD. Finally, create a batch file called SHELL.BAT containing the following commands:

```
C:
CD \DOS
COPY SHELLCFG.HLD DOSSHELL.INI
DOSSHELL
```

Note that this batch file assumes that your DOS files are stored in a directory called C:\DOS. If that's not the case, change the first and second lines accordingly.

Whenever you want to use the DOS Shell, type `SHELL` instead of `DOSSHELL`. This command runs SHELL.BAT, which doesn't start the DOS Shell until it copies to DOSSHELL.INI the configuration you created earlier. As I said, it's not an elegant solution, but it works. And it guarantees that you won't lose any more files if you activate the Select Across Directories setting accidentally.

DOS TIP

EXPAND YOUR PATH'S HORIZONS

The DOS PATH command carries a 127-character limit, which can put you in a bind when you need to list several deeply nested program directories in your AUTOEXEC.BAT's PATH statement. Fortunately, you can shorten a long path by using the SUBST command to assign part of it to an unused drive letter.

To use this trick, first make a few extra drive letters available by adding the following line to your CONFIG.SYS file:

```
LASTDRIVE=J
```

(Without LASTDRIVE, DOS provides only one more drive letter than is in use on your system.) Next, add a line such as the following to your AUTOEXEC.BAT file, placing it before your existing PATH statement:

```
C:\DOS\SUBST J: C:\JW\DISTRICT\BRANCH\COMPANY\PROGRAMS\EXE
```

In this example, the pathname C:\JW\DISTRICT\BRANCH\COMPANY\PROGRAMS\EXE is "renamed" as drive J.

Finally, edit your PATH statement, adding a reference to the substitute drive letter. For instance, if your PATH statement were as follows:

```
PATH=C:\;C:\DOS;C:\WINDOWS;C:\UTILS
```

the edited version might read:

```
PATH=C:\;C:\DOS;C:\WINDOWS;C:\UTILS;J:\;
```

(You should list the entries in PATH in order, from those used most often to those used least often.)

After you've made the substitutition, your PATH will be considerably trimmer. In the above example, for instance, using SUBST trims 39 characters from the command. Of course, if making one substitution doesn't reduce your PATH below 127 characters, you may make additional substitutions, assigning other drive letters to similarly long directory names.

—John Wolfskill

Lost Directories

I use MS-DOS 5 and sometimes have trouble copying the contents of multiple floppy disks to my 386's hard disk. I can copy the first disk without a problem. When I insert a second disk, however, XCOPY *tries to copy the same files it found on the previous disk. The result is chaos and corrupted data. If I interrupt* XCOPY *and type a* DIR *command, I see the filenames from the first disk instead of those on the disk currently in the drive. What's happening, and how can I prevent this situation?*

Karl Alexander
Phoenix, Ariz.

I experienced similar symptoms on one of my 386 computers back when I was using DOS 5. I finally traced the problem to the way a memory manager I was using configured the upper memory on this system. Because you mention in your letter that you have a 386 computer and that you're using DOS 5, I'm going to assume you're suffering from the same affliction.

Memory managers for 386 and newer systems free up for other uses what they identify as inactive portions of high memory: RAM located between 640K and the 1MB address at which extended memory begins. As a rule, that works fine. The 384K block of memory above 640K is largely empty. Most of it was reserved for what IBM described originally as "future uses." Well, more than a decade after the first PC rolled off the production line, those "future uses" have yet to materialize. Consequently, only a few portions of high memory are critical to keeping certain components of your system running properly. The rest, presumably, is available for use by a memory manager.

With the groundwork laid, let's get to the crux of your problem. Those "certain components" controlled in high memory include your floppy-disk drives. It appears that on some machines some memory managers mistakenly assume they can use a portion of high memory on which the computer's BIOS depends to control floppy-disk operations. (I'd like to be more specific, but IBM compatibility is an ambiguous condition at best; which computers have problems with what memory managers depends on too many variables to nail things down precisely.) One clear indication of such a conflict is that DOS doesn't detect it automatically when you insert a new disk into a floppy drive.

So how do you correct a problem like this? Most memory managers let you declare particular address ranges off limits to their digital manipulations. Usually, you do that by including an EXCLUDE parameter, or something similar, in the line within CONFIG.SYS that loads your memory manager at start-up. If you can find out from your computer's manufacturer which sections of high memory its BIOS uses to control floppy-disk operations, you can prevent your memory manager from interfering with that critical task. Although it may require some detective work on your part, your reward will be dependable disk operations.

If adjusting memory-manager settings doesn't resolve the difficulty, you may have a hardware problem. Most likely, something is interfering with your drive's ability to detect change-line status, a setting DOS uses to recognize that the drive door has been opened or closed since the previous operation. A broken wire in your controller cable or a faulty switch in the drive itself might cause trouble of this sort.

One possible software solution is to insert a DRIVPARM command into your CONFIG.SYS file to override change-line status detection. Your DOS manual should explain the appropriate syntax. If you're uncomfortable messing with hardware settings, however—or want to fix the problem permanently—I recommend that you have a reliable service technician check out the troublesome drive.

More Mysterious Memory Quirks

My NEC PowerMate 286 Plus manual says I can "move the 384K of high RAM (above 640K conventional) to extended RAM." It further states that to do this I must disable both video and system BIOS shadowing first. What are these items, and what price do I pay for creating the extended RAM, if it's possible? My machine has only 1MB of memory. If I do all this, may I then use DOS 5's HIMEM.SYS to run portions of DOS in high memory?

Theodore L. Felsentreger
Gambrills, Md.

I'll answer your questions in the same order in which you posed them. Video and BIOS shadowing is a process by which your computer transfers the code that normally controls your display and BIOS operations from the chips on which they're stored to a special section of RAM. When you do this, the code executes more quickly, thereby improving overall system performance. Turning off the shadowing feature, then, will make your system run a little more slowly.

As to whether you can move your 384K of high RAM to extended memory, the answer is no: not because it can't be done, but because you have no extended memory to use for that purpose. By definition, extended memory begins at memory address 1MB. Because your system has a total of only 1MB, it lacks the extended memory this procedure requires. (Technically, you can't "move" high RAM, but you can remap its functions to extended memory. NEC took some liberties with semantics on this one.)

Finally, can you use HIMEM.SYS to load parts of DOS into high RAM? Probably not. That works only on certain 286 systems, primarily those that use Chips & Technologies BIOS chips or chips that are 100-percent compatible with them. Turn off your 286's shadowing feature and try it, but don't be disappointed if you get a message stating that no memory is available to load HIMEM.SYS.

In truth, the various memory-management features Microsoft added recently to DOS have only limited value on anything less than a 386 system. On a 286 system, HIMEM.SYS works only rarely, and you can't use the 386EMM.EXE memory manager at all. That's why 286 systems virtually disappeared from the market when the 386 chip was introduced.

Jack Nimersheim has been using computers and writing about them for 14 years. He is the author of two dozen books on computer-related topics. His newest book, Slick Tricks: DOS 6.2 *(Random House Electronic Publishing), was released in April.*

DOS TIP

TESTING: ONE, TWO, THREE

Tracking down a problem in a long and complicated batch file is no easy task. Luckily, DOS 6.2 offers a way to step through a batch file one line at a time. You simply invoke a secondary copy of the DOS command interpreter, COMMAND.COM, following it with two switches and the name of the file you want executed. To step through a program called MYFORMAT.BAT, for example, use this command:

```
COMMAND /Y /C MYFORMAT
```

The /Y switch tells DOS to pause before executing each line and ask the user whether to execute the line. /C tells the command interpreter to perform the specified command one string at a time.

—Jack Nimersheim

DOS WORLD

Q&A

DOS

Q Before I installed DOS 6.0, I modified the DOS program FORMAT.COM (using the DOS Debug program) to add the BEL character (ASCII 7) to the prompt string:

```
Volume label (11 characters,
  ENTER for none)?
```

This small modification would sound a tone each time a disk-format operation was completed. It let me do other work while the computer formatted a disk, and alerted me when the job was complete. Although the prompt string is still displayed in DOS 6.0, using Debug, I can't seem to locate it to perform the modification. Can you tell me where the prompt string is now located within the program?

A Starting with version 6.0, all DOS utility programs are stored on your disk in compressed (tokenized) format. Each time you start the program DOS uncompresses it first. Therefore, you can no longer modify program prompt strings without the risk of damaging the disk file. DOS 6.x includes enhanced commands, however, which let you create the same results without modifying FORMAT.COM.

The DOS batch file FMAT.BAT, with the help of a data file called NO.DAT, sounds a beep after you format each floppy disk, lets you format as many disks as you want, tells FORMAT.COM to accept a disk label name automatically, and lets you exit to the DOS system prompt when you're done. (See the accompanying program listing below.)

First you must create a small data file called NO.DAT in the same directory where FORMAT.COM resides (usually C:\DOS). NO.DAT creates a keyboard response file, which DOS uses to answer the following prompt:

```
Format another disk (Y/N)?
```

automatically with the letter N, followed by a carriage-return character. To create NO.DAT, type this line:

```
C:\DOS>COPY CON NO.DAT
```

then press Enter. The cursor drops to a blank line and waits for you to enter additional text. Press Enter again. Type the letter N, then press Enter a final time. Your input screen should look like this:

```
C:\DOS>COPY CON NO.DAT
N
```

with the cursor located on a blank line immediately below the line containing the letter N. Press F6, then press Enter to write NO.DAT to disk.

Now it's time to create FMAT.BAT. Most word processors and text editors don't let you enter the BEL character (ASCII 7) from the keyboard. Therefore, you must type in FMAT.BAT at the DOS command line. To create FMAT.BAT, enter this line:

```
C:>COPY CON FMAT.BAT
```

then press Enter. The cursor drops to a blank line and waits for you to enter additional text. Type in the listing for FMAT.BAT exactly as it appears here. Remember to press Enter after typing each line. When you reach the fourth line type ECHO, then press the spacebar. Hold down the Alt key. Now type the characters 007 on your numeric keypad (Num Lock on). Release the Alt key. DOS prints the following characters:

```
ECHO ^G
```

To hear more than one beep, repeat the Alt+007 procedure above. Press Enter to end the line. Now type in the remainder of the program exactly as it appears in the listing. When you're through, press F6, then press Enter a final time to write FMAT.BAT to disk.

FMAT.BAT requires two replaceable parameters, specified by %1 and %2 in the batch listing. The first parameter indicates the drive into which you've inserted your new disk for formatting (usually A: or B:). The second parameter indicates the volume label you want. (If you don't want to place a volume label on the disk, leave the second parameter blank.)

Here's an example:

```
FMAT A: JOHN
```

This line tells the program you want to format a disk in drive A,

FMAT.BAT formats and labels a disk and sounds a beep tone when done.

```
@ECHO OFF
:START
FORMAT %1 %2 < NO.DAT
ECHO ^G
ECHO [1] EXIT TO DOS
ECHO [2] FORMAT ANOTHER DISK
CHOICE /C:12
IF ERRORLEVEL 2 GOTO START
```

End

with the volume label JOHN. To run the program type this line:

```
FMAT A: JOHN
```

FMAT.BAT starts FORMAT.COM, which formats and labels your disk. When the operation is complete, a beep tone sounds. The program then waits for you to press a key. Type 1 to exit to DOS, or 2 to format another disk.

Q I tried to use DOS 6.x's MSBACKUP.EXE to back up data from one drive and DOS 5's RESTORE.COM to restore the backup information on another PC. Unfortunately, all I got was a "Can't read volume information" error message. What's going on?

A Because their file formats are incompatible, you can't use DOS 5's RESTORE.COM to restore a backup set created with DOS 6.x's backup program. Nor can you call DOS 6.x's MSBACKUP command on a PC on which DOS 5 is installed.

You can work around the problem, however, if you're willing to spend $5.95 for the MS-DOS 6 Supplemental Disk. (You'll find a coupon for it in the back of your MS-DOS manual.) This disk contains versions of BACKUP and RESTORE that work with backups made using DOS 5 and earlier.

To back up data from the PC that uses DOS 6.x and restore it on the DOS 5 PC, you must copy the file named BACKUP.EXE from the supplemental disk to the C:\DOS directory on the PC running DOS 6.x. Next, you must add the filename BACKUP.EXE to the SETVER table in the DOS 6.x PC. This tricks DOS 6.x into thinking DOS 5's backup program is actually a DOS 6.x utility.

For information on adding BACKUP.EXE to DOS 6.x's SETVER table, type `HELP SETVER` at the DOS prompt.

Q I use MSBACKUP to back up a Toshiba T-1910 notebook PC, dutifully running the configuration programs to set up and test my drives for compatibility. Although MSBACKUP seems to back up my files correctly, it doesn't compress the files when I enable the compression check box in MSBACKUP's dialog box. The program calculates the number of disks required for a backup operation that uses compression, but the backup files don't seem to be compressed. What gives?

A You don't say which version of MS-DOS 6.x you use, so I can't nail down the problem. But if you have MS-DOS 6.21, there's an easy explanation for the trouble you've encountered: MSBACKUP.EXE's file-compression functions don't work in this DOS version.

If you're using MS-DOS 6.0, 6.20, or 6.22, however, MSBACKUP should compress files as much as possible. But with certain files—including EXE, COM, and other binary program files—"as much as possible" means not by very much. MSBACKUP simply can't significantly reduce the size of such files.

Q Is it my imagination, or does DOS 6.22's FORMAT.COM utility wait a lot longer to begin working when I specify the unconditional switch, /U? Sometimes more than 10 seconds elapse before formatting actually begins. As I recall, this operation was very fast in previous versions of DOS 6. When I'd type `FORMAT /U` and press a key, the program would start formatting my floppy disk immediately. What happened?

A In DOS 6.2 and later, the default settings for FORMAT are different. To format new disks (or reformat previously formatted disks whose data you're certain you don't need) with the same efficiency as before, you must add a /C switch:

```
FORMAT A: /U /C
```

Q My PC's DIR and CHKDSK commands report different amounts of available disk space. Although I haven't made an exhaustive survey, I've checked other PCs in my office. On these systems, the free disk space reported by DIR and CHKDSK agree exactly. Why am I getting different results?

A The discrepancy may be caused by a deletion protection program, such as DOS's Undelete Sentry, or The Norton Utilities' SmartCan.

When a deletion-protection program deletes a file, it isn't erased immediately. The file is merely moved to a hidden directory, where it remains until its disk space is needed by a new file. Because the DIR command doesn't "see" the files in this hidden directory, it declares that the space occupied by the protected files is free.

CHKDSK, on the other hand, analyzes the space occupied by all files on your disk, including files in hidden directories. If you purge the deleted files by typing `UNDELETE /PURGE`, the counts reported by DIR and CHKDSK should match.

Q I have a program that changes the color of the display. When I quit this program, the DOS screen displays yellow characters on a black background. How can I reset the screen from yellow and black to the standard white-on-black DOS display?

A I wish all fixes for DOS problems were so simple. To set things straight, type the following line at the DOS prompt:

```
MODE CO80
```

HARDWARE

Q I recently bought a new 66MHz 486DX2 system with a 500MB IDE drive, 16MB of RAM, and MS-DOS 6.21. All my Windows applications seem to run faster, but some DOS programs load more slowly than they did on my 33MHz 80486, which had 8MB of RAM, a 250MB hard drive, and DOS 5. Is it normal for load times to increase when you have a larger hard drive or considerably more RAM? Can you offer advice on how I might get my DOS programs to load faster?

A A larger hard drive and more memory have little impact on loading times. The new drive's data-transfer rate and average access time and the speed of your new PC's RAM chips exert a stronger influence.

The types of software you load—device drivers, memory-resident programs, disk-caching programs and other utilities—also influence loading performance.

The degree to which files are fragmented (stored in sectors that aren't contiguous) certainly has an effect, as well. To load programs more quickly, I recommend that you run DOS's defragmenting program, DEFRAG, regularly.

You also should use a disk-caching program, such as SMARTDRV.EXE, and load only the device drivers and memory-resident programs that are essential to support your computing needs.

In addition, a caching hard-disk controller (with at least 2MB of on-board RAM) can make a substantial difference in the performance of your system and thus improve the speed with which files are loaded.

Q Should I take special precautions when installing a second IDE drive in a system that already has a DOS 6.x DoubleSpace host drive?

A Yes, you must make sure the drive letter for your existing DoubleSpace host drive doesn't conflict with the one DOS will assign to your new hard drive. For example, if your DoubleSpace host drive currently uses drive D (the next available letter following the one assigned to your existing hard drive, drive C), you must change its assigned drive letter to E before you install your new hard drive.

You may take two approaches. Although it's a colossal pain in the neck, Microsoft recommends that you uninstall your existing DoubleSpace host drive, then reinstall it after installing your new drive. Or you can change the DoubleSpace host-drive letter by editing your DBLSPACE.INI system file. Because DBLSPACE.INI is one of the DOS system files that controls access to your hard drive, I strongly recommend making a complete backup of your system, should you decide to take the latter approach.

The first step is to change the attributes of DBLSPACE.INI, which is designated as a system file with hidden and read-only status. (The program should reside in the root directory of your uncompressed drive, drive D.) The following command removes these attributes so that you can edit the file:

```
ATTRIB -S -H -R DBLSPACE.INI
```

As a further precaution, I suggest you insert a blank floppy disk into drive A, then copy DBLSPACE.INI to that disk. That's your insurance policy, should you make a mistake while editing the file.

Next, load DBLSPACE.INI into your word processor and look for the line that starts with the following:

```
FirstDrive=drive
```

where *drive* is a drive letter. Assign it the first letter that will be available after you install your new hard drive. For example, if your existing hard-disk drive is drive C and your DoubleSpace host drive is drive D, your new hard drive will become drive D, and the DoubleSpace host drive will be drive E. Your FIRSTDRIVE line will read as follows:

```
FirstDrive=E
```

Next, look for the line that starts with the following:

```
LastDrive=drive
```

In this case, change the disk-drive letter to the same as that used in the FIRSTDRIVE command. Then locate the line that starts with the following expression:

```
ActivateDrive=drive,C0
```

and change it to read as follows:

```
ActivateDrive=E,C0
```

If your existing DoubleSpace host drive is already assigned a drive letter higher than D, you need to change only the value of FIRSTDRIVE.

Finally, save the modified DBLSPACE.INI file, then type the following line:

```
ATTRIB +S +H +R DBLSPACE.INI
```

to restore the file attributes to their original status.

When you press Ctrl+Alt+Del to restart your computer, DOS will mount your existing DoubleSpace host drive as drive E. You can then install your new hard drive according to the manufacturer's instructions. Your new drive should appear automatically on the system as drive D.

Q I have DOS 6.2 and want to increase the size of my uncompressed DoubleSpace disk. But when I use DoubleSpace's Change Size option, the program tells me that my files are too fragmented for it to perform the operation. DoubleSpace then instructs me to run CHKDSK and DEFRAG to correct the problem before proceeding. When I follow these instructions to the letter, however, DoubleSpace still tells me that the files are too fragmented. Can you help?

A The problem you describe sometimes occurs when a system file is stored near the end of your compressed DoubleSpace disk volume.

By convention, a system file is defined as any file whose read-only, hidden, or system file attribute is set. Typically, such files are placed on your disk by commercial programs; one or more of the attributes is set to prevent you from accidentally erasing a file critical to an application's operation.

MS-DOS itself creates a system file for the deletion-tracking command, MIRROR. If you use MIRROR, be on the lookout for a file named MIRRORSAV.FIL.

To correct the problem, you must locate all such files and remove their attributes before running DEFRAG. You may produce a printout of all the files on a hard disk whose system attribute is set by typing:

```
DIR /S /AS > PRN
```

If DOS turns up any protected files, first remove their file attributes by typing:

```
ATTRIB filename.ext -R -H -S
```

Then, restart DEFRAG by typing:

```
DEFRAG /Q /H C:
```

You then should be able to successfully defragment your DoubleSpace disk volume and resize your uncompressed disk volume.

Afterwards, use the following syntax to restore to their original status the files whose attributes you changed:

```
ATTRIB filename.ext +R +H +S
```

If the above procedure doesn't solve your problem, you may need to increase the MAXFILEFRAGMENTS setting in your DBLSPACE.INI file.

The MAXFILEFRAGMENTS parameter sets the maximum number of file fragments allowed in a compressed volume file (CVF). To increase the setting, you first must remove the read-only, system, and hidden file attributes from your DBLSPACE.INI file. For example, if E is your DoubleSpace host drive, type this at the DOS prompt:

```
ATTRIB E:\DBLSPACE.INI -R -S -H
```

Load DBLSPACE.INI into your text editor to make the required modification. Locate this line:

```
MaxFileFragments =
```

Replace the number you find there with a larger number, such as 1500. Save the modified file to disk, then use the ATTRIB command to restore DBLSPACE.INI's file attributes to their original status:

```
ATTRIB E:\DBLSPACE.INI +R +S +H
```

Reboot your computer and try to resize your uncompressed drive. If you still can't resize the drive, you may have a bad data sector on your host drive, near the end of your CVF. To correct the problem, you may use DOS 6.2's SCANDISK.EXE utility to "lock out" the bad sector. The following command syntax should do the trick:

```
SCANDISK E: /SURFACE
```

QBASIC

Q Can you explain exactly what QBasic's SYSTEM statement does?

A The SYSTEM statement automatically closes all open QBasic files, and then returns control to your operating system. You may use SYSTEM wherever you would use an END statement. Instead of passing control to the QBasic editor, as END does, SYSTEM returns control automatically to the DOS prompt, which makes the command an ideal way to end QBasic programs that you plan to execute within a batch file.

A simple example should make things clearer. Let's say you want to write a batch file that does something DOS can't do. You know that QBasic can handle the task, so you write a batch file and a QBasic program that together get the job done.

The general format of the batch file would look like this:

```
@ECHO OFF
REM The preliminary batch file
REM tasks are handled here.
.
.
QBASIC /RUN CANDO.BAS
REM Control returns to
REM the batch file, which does
REM the remaining work
REM that needs doing.
.
.
```

The outline of the QBasic program would look like this:

```
'CANDO.BAS
DEFINT A-Z
CLS
'This section of the program
'handles xxxx.
.
.
.
SYSTEM
```

When you run the batch file, it performs its preliminary tasks, then executes QBasic and then runs CANDO.BAS. You don't see the QBasic editor.

When CANDO.BAS's work is done, QBasic executes the SYSTEM statement, returning control to the next line of the batch file. ■

"Q&A" is compiled by Technical Editor John Wolfskill, who is president of Powertrain Development, a New Hampshire-based software development company.

WINDOWS SEAT

Associating With Windows

by Eric Maloney

If you're a DOS user who has moved to Windows, you've probably found out that the quickest way to run a DOS program is to create an icon for it. No more fumbling around at the C: prompt—just click on the icon, and Windows does the rest.

But when you use an icon instead of the C: prompt, you lose some versatility; you can't run a program and load a data file with a single command anymore. Instead, you must revert to the far less convenient method of loading the program and the file in two separate steps.

Just as Windows gives you icons for program files, the Associate command lets you create launchable icons for data files.

For example, under DOS, you can type 123 94BUDPRO at the DOS prompt to load Lotus 1-2-3 and access a spreadsheet called 94BUDPRO.WK1 automatically. In Windows, you have to click on the 1-2-3 icon first to load the program and then use the File Retrieve option to find and load the document. This is progress?

But this obstacle is surmountable: You can load a program *and* file via File Manager's Associate command. Just as Windows gives you icons for program files, Associate lets you create launchable icons for data files. You click on the icon, perhaps labeled 1994 Budget Projections, and Windows runs 1-2-3 with 94BUDPRO loaded.

Linking Up

When you associate files, you're telling Windows that all files with a specific extension go with a specific program. For example, all files with the WRI extension are associated with Windows Write. In File Manager, you can identify associated files by four lines in the little document graphic that sits to the left of the filename. If you look at the Windows subdirectory, you'll see that README.WRI, PRINTERS.WRI, and all other WRI files show those four lines.

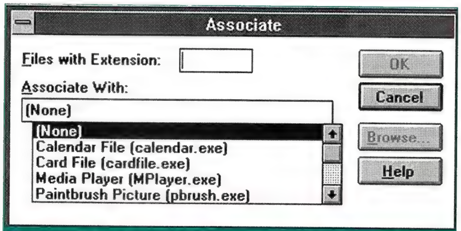
Once you've created an association, you can treat the data file essentially like a program. As a demonstration, open File Manager, change to the Windows subdirectory, and click on README.WRI. Write will pop up with README.WRI loaded.

To create an association between a DOS program and its data files, open the File menu (Alt+F) in File Manager and choose Associate. You'll see a dialog box like the one in the first accompanying screen shot (facing page, top left). Type the extension of the files

ATTENTION

Windows Users

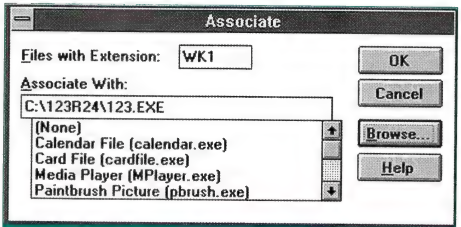
If you use Windows regularly, you probably know a few tricks yourself. Or perhaps you've found a better way to do the job described here. This column is your chance to share your techniques with other Windows users. Contact the Windows Editor at DOS World, *80 Elm St., P.O. Box 802, Peterborough, NH 03458-0802, or on CompuServe (75300,2357) or MCI Mail (667-4854).*


Associate
OK
Cancel
Browse...
Help
Calendar File (calendar.exe)
Card File (cardfile.exe)
Media Player (MPlayer.exe)
Paintbrush Picture (pbrush.exe)

Files with Extension:

Associate With: (None)

Associate dialog box. Use this screen to assign an extension with its related program.


Associate
OK
Cancel
Browse...
Help
(None)
Calendar File (calendar.exe)
Card File (cardfile.exe)
Media Player (MPlayer.exe)
Paintbrush Picture (pbrush.exe)

Files with Extension: WK1

Associate With: C:\123R24\123.EXE

Associating files. Here, files with the extension WK1 are associated with Lotus 1-2-3.

you want to associate with the program. For example, enter `WK1` for Lotus 1-2-3 files. Next, tab to the Associate With box and type the path and name of the program: in this case, `C:\123R24\123`. If you don't know where the program is, click on the Browse button to search your directories.

When you're done, the Associate dialog box will look something like the one in the second screen shot (above). Press the Enter key to put the association into effect.

Now look at the list of files in File Manager. You'll notice that data files with the extension you specified for association show four lines running through the icons next to those filenames. You can click on any of these files to run the program and load the data file.

Creating the Icon

The next step is to create the icon for your data file. The easiest way is to tile File Manager and the group in which you want to put the icon; just press the Ctrl+Esc key combination to pop up Windows' Task List, and choose the Tile option.

Find the data file in File Manager and drag it into the Program Manager group.

When you release the mouse button, you'll have a generic MS-DOS icon with the filename as the title. (See the third accompanying screen shot, below.)

Thereafter, whenever you click on the icon, Windows will run the program and load the appropriate data file automatically.

Instant Access

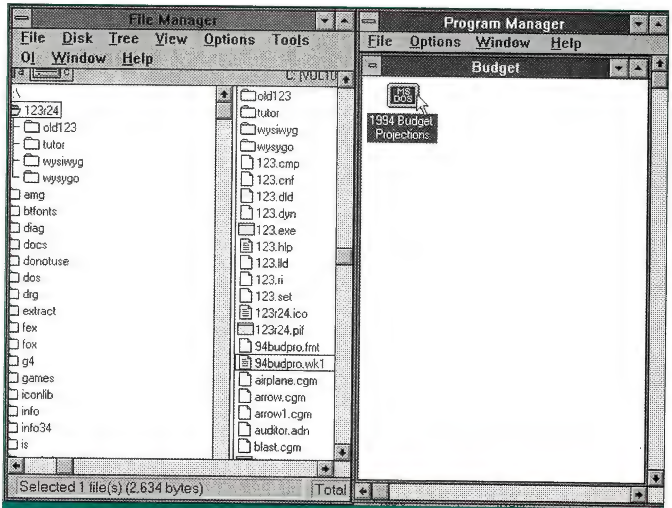
Here's one other trick to let you get to the file even faster than with the icon: Assign the icon a hot key. For example, let's assume you want to be able to call 94BUDPRO by pressing Ctrl+Alt+B. Click once on the 94BUDPRO icon. Go to Program Manager's Program Item Properties box and choose the Shortcut Key option. Press B. Windows precedes it automatically with Ctrl+Alt. (See the fourth screen shot, page 73, top.)

You now can press Ctrl+Alt+ B from anywhere within Program Manager, regardless of whether the Budget group is displayed, and Windows will retrieve 94BUDPRO.

If you want to change the title of your icon to something more descriptive, choose File/Properties from Program Manager's menu bar. Put the new title into the Description box and click on OK.

The New Paradigm

Once you start using Associate regularly, you might find that your



Selected 1 file(s) (2,634 bytes)

Creating an icon for a data file. Tile File Manager and the group in which the icon will appear, and then drag the file's icon from one to the other.

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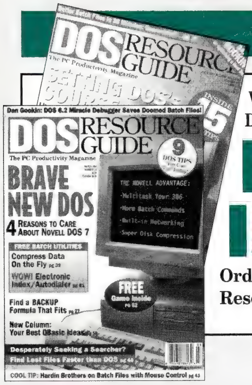
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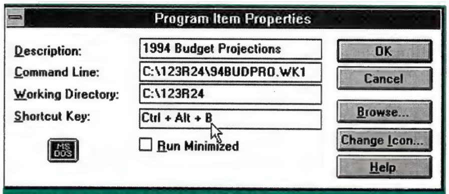
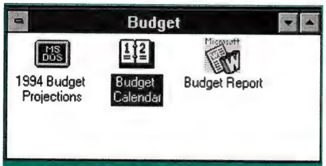
Send your check or money order to: DOS World P.O. Box 672 Mount Morris, IL 61054 concept of file organization will change. DOS users tend to organize their disks by application, with spreadsheets in one subdirectory, text files in another, and so on. A more efficient way is to group files by subject or project, regardless of what types of files they are.

For example, you might also have a budget report in Word for Windows and a Calendar file listing deadlines and meetings. It simply makes sense to put them with your budget spreadsheet. The result might be a group like the one in the final screen shot, (below right).



Description: 1994 Budget Projections
Command Line: C:\123R24\94BUDPRO.WK1
Working Directory: C:\123R24
Shortcut Key: Ctrl + Alt + B
☐ Run Minimized

Assigning a shortcut key to a data file in the Program Item Properties box. In this case, pressing Ctrl+Alt+B will run Lotus 1-2-3 and load the spreadsheet 94BUDPRO.WK1 automatically.



Managing projects with groups. This group contains icons for three different types of data files, related by subject.

Drawbacks

Now, before you go on a big Associate binge, note that this particular Windows function has two notable weaknesses.

First, you have to create icons for your associated files manually. Unlike Symantec Corp.'s Norton Desktop, Windows won't set up an icon automatically when you create a file. This deficiency isn't a problem if you're working with a stable group of files, but it makes Associate more trouble than it's worth if you're constantly creating new files.

Second, Windows loses track of a file if you move it to a new directory. When you click on the file's icon, Windows gives you an error message. You have to use Program Manager's File Properties dialog box to enter the file's new pathname.

Still, the Associate command makes sense if you use particular data files on a regular basis.

And customizing your screen this way helps give Windows more of the intuitive look and feel you expect from this highly visual, "user-friendly" operating environment. ■

Eric Maloney is the former editor in chief of 80 Micro, *the founding editor of* PC Resource, *and the former editor in chief of* LAN Technology *magazine. He's* DOS World's *editor at large.*

DOS TIP

COPY WITH CONFIDENCE

Have you been using the COPY /V command under false assumptions? The /V (for *verify*) switch doesn't compare the duplicate file against the original file, as you might expect. Instead, it ensures only that data written to disk can be read later from that disk without error.

If you need to ensure that the files you create are exact duplicates of the files you copy, create a batch file that uses DOS's file-comparison utility, FC, to perform a byte-by-byte comparison of the source file and its copy. These two lines will do the job:

```
COPY filename.ext C:\STUFF
FC filename.ext C:\STUFF\filename.ext /B
```

(The /B in the second line tells FC to treat the files as binary files, which forces the program to read to the end of all files even if it encounters embedded characters that could be interpreted as ASCII end-of-file markers.)

The above commands have one distinct shortcoming, however: They work only on a particular file and its duplicate. Fortunately, you may use variables to create a more generic version. Only three lines are required:

```
@ECHO OFF
COPY %1 %2
FC %1 %2 /B
```

If you name this file CC.BAT, you may call it by typing:

```
CC [path1:\]filename.1 [path2:\]filename.2
```

substituting the appropriate path and filenames for the italicized information.

When you invoke CC.BAT, COPY duplicates the file you specify, then FC checks to make sure the source and target files are identical. If they are, FC issues a "No difference encountered" message. Otherwise, it displays a list of bytes that are different within the source and target files. If FC spots a content error, continue invoking CC.BAT until the files match.

To copy and compare several files at once, simply use wildcards. The following command, for instance, copies all the files in C:\PW to C:\PW-\STUFF, later checking to ensure that the copied files are identical to the originals:

```
CC C:\PW\*.*  C:\PW\STUFF\*.*
```

—John Wolfskill

DOS Challenge

TEST YOUR DOS IQ

ANSWERS

DOS Lore and Legend

1 The Apple II's operating system was known as DOS until about 1985. Before then, what we call DOS today was known as PC DOS or MS-DOS. Around 1985, Apple introduced ProDOS for its Apple II series; as a competitive force in the marketplace, though, the Apple II's popularity started to wane, with the Macintosh picking up the slack. Meanwhile, as the IBM PC's popularity increased, and as the distinction between PC DOS and MS-DOS blurred in the eyes of the public, those operating systems became the vernacular "DOS."

2 Tim Patterson (d) of Seattle Computer Products wrote QDOS for the 8086 microprocessor. Microsoft required an 8086 operating system for IBM's new computer; the company bought Patterson's QDOS, which it then reworked into PC DOS 1.0 for IBM.

3 Only DEBUG (c), EDLIN (e), and FORMAT (f) were included as "external" commands in DOS 1.0; all the other commands were "internal." On the IBM side, the DISKCOPY and DISKCOMP utilities were included in PC DOS 1.0. Eventually they became part of MS-DOS's repertoire as well.

4 DOS 3.0 was out for only three months before 3.1 replaced it. IBM was hot to introduce its new 80286 computer, the PC/AT, and Microsoft didn't feel DOS 3.0 was the best it could do in the time allotted. Three months later, the company released the improved DOS 3.1, which, for the first time, included some networking functions. The longest time span between one DOS version and the next was three years: between DOS versions 4.0 and 5. Technically speaking, DOS 4.0 was an IBM-only invention, so the longest time between versions of Microsoft's DOS was the four-plus years between versions 3.3 and 5. Why the time lapse? Microsoft was betting the bank on OS/2, introduced with DOS 3.3 in April 1987, and considered DOS "dead." The second-shortest time span between one DOS version and the next was five months: between DOS 1.1 and 2.0. (DOS 6.0 and 6.2 have six months between them.) The second-longest time span between two DOS versions was the 21 months between DOS 5 and DOS 6.0. See the accompanying table (below) for an outline of all this date-line trivia.

5 **a)** subdirectories = DOS 2.0
b) IBM PC/AT support = DOS 3.0
c) DOS Shell = DOS 4.0
d) 3.5-inch disk drives = DOS 3.2
e) batch-file CALL command = DOS 3.3
f) large-hard-drive support = DOS 4.0
g) memory management = DOS 5

6 DOS 3.3. It was supposed to be the "last" version of DOS, since OS/2 was to be the future. Apparently Microsoft believed that; more than four years passed before the company wrote another version of DOS, version 5, released in June 1991. (DOS 4.0 was an IBM aberration.)

7 False. MEM first appeared in DOS 4.0. It was DOS 4.0 that contained memory-management device drivers. The problem was that DOS 4.0 was incompatible with some disk utilities, and people shied away from it. Its memory-management device drivers, however, lived through to DOS 5, which expanded them and included other memory-management commands.

Nuts & Bolts

1 CONFIG.SYS runs before AUTOEXEC.BAT. But it's actually the fourth file DOS looks for when it starts up; the first three are DBLSPACE.BIN (which runs before anything else), MSDOS.SYS, and IO.SYS (or IBMDOS.COM and IBMBIO.COM in PC DOS and Compaq DOS). IO.SYS searches for CONFIG.SYS in the root directory of the boot disk. If it finds CONFIG.SYS, it reads in the instructions and carries them out. (Incidentally, it reads in those instructions all at once, but carries them out in a specific pecking order, determined by DOS.) If IO.SYS doesn't find CONFIG.SYS, DOS makes some lousy assumptions and continues to fire up your PC.

2 CONFIG.SYS runs before COMMAND.COM. It contains the SHELL command, which determines whether COMMAND.COM runs. Microsoft made DOS flexible so that you could use other command interpreters in place of COMMAND.COM. One example is J.P. Software's 4DOS, which is also available as Peter Norton's NDOS (part of Symantec Corp.'s Norton Utilities). Since that's a valid option, CONFIG.SYS must run first to tell DOS which command interpreter to use.

3 Six internal DOS commands have two names, usually a short and a long version (although in the case of DEL and ERASE, it's two different names for the same command):

CD and CHDIR
DEL and ERASE
LH and LOADHIGH
MD and MKDIR
RD and RMDIR
REN and RENAME

4 REM, SET, BREAK. This may fool some old DOS hands, since two of these shared CONFIG.SYS/AUTOEXEC.BAT commands—REM and SET—are available only with DOS 6.0 and later. The logic behind including SET in CONFIG.SYS is that you can then dispense with AUTOEXEC.BAT altogether (although it's not recommended) and use SET to create your PATH, PROMPT, TEMP, and other environment variables.

5 DOS's three "toggle" commands turn an option on or off. Alone, each command displays whether the setting is currently on or off.

BREAK: Forces DOS to pay attention to Ctrl+Break (and Ctrl+C) even when it's not displaying information on screen or awaiting input.

ECHO: Switches the command display on or off when a batch file runs, or the DOS prompt on or off when a batch file isn't running.

VERIFY: Directs DOS to check that information written to disk is readable (not really necessary for today's reliable disks).

6 This is a toughie, since a lot of batch-file commands, filters, and other commands may not display anything if you use them properly. But two DOS commands that never, ever display anything are CLS (clear the screen) and EXIT (quit COMMAND.COM).

DOS VERSION	DATE INTRODUCED
1.0	August 1981
1.1	October 1982
2.0	March 1983
2.1	November 1983
3.0	August 1984
3.1	November 1984
3.2	January 1986
3.3	April 1987
4.0	July 1988
5	June 1991
6.0	March 1993
6.2	September 1993

7 FIND, MORE, and SORT. The FIND filter locates bits of text, either in a file or in the output of a DOS command. The MORE filter displays a "more" prompt and waits for you to press a key to continue. Use it when you're displaying long text files or want to pause the long output of certain DOS commands. The SORT filter sorts information in text files or the output of DOS commands. It sorts alphabetically, in reverse order, or based on a certain "column" of the text file.

8 CON: the console device
(screen and keyboard)
PRN: the printer
AUX: the COM1 port
NUL: the null device
A through Z: the disk drives

The standard error device (the display) also counts, although it has no cutesy three-letter acronym, and you can't redirect it, as you can the CON device. The LPT1 and COM1 device names aren't considered "standard" devices, although it's true they're DOS devices and you can use them as such. DOS uses the CLOCK$ device internally.

9 False. Although they both "point at" the first printer port, PRN and LPT1 are different devices low in DOS memory, each with its own "personality." Practically speaking, however, they're interchangeable.

10 This is a toughie, and there are probably many answers to the question of how PC DOS and MS-DOS differ. A popular, though incorrect, answer may be "One's from IBM, the other's from Microsoft." True, but that's not the *major* difference. Here's my answer: PC DOS comes with a version of Basic that runs only on IBM computers; MS-DOS's early version, GW-Basic, ran not only on IBM PCs, but also on compatibles, as does today's QBasic.

The PC DOS Basic program (and BasicA) is the source of headaches for many DOS users. PC DOS may run fine, but you may find that when you try to run Basic the computer crashes. The reason is that this version of Basic for PC DOS runs only on genuine IBM equipment. (The same holds true for Compaq DOS and its Basic on Compaq machines.)

11 The three redundant CONFIG.SYS configuration commands are BREAK=OFF, DOS=NOUMB, and DOS=LOW. Each one sets an option that's already set that way when the computer starts: BREAK is off; there are no UMBs when DOS starts; and DOS loads low unless you tell it otherwise. In fact, if you have any of these commands in your CONFIG.SYS, you can delete them with a clear conscience.

12 The /S switch should be standard to mean "include all subdirectories." For the following six DOS commands, it does mean exactly that: ATTRIB, BACKUP (before DOS 6.0), DIR, REPLACE, RESTORE (before DOS 6.0), and XCOPY. Unfortunately, some DOS commands use /S for something else. For example, the FORMAT command uses /S to make a system disk.

13 The volume label is really pretty useless, but the following commands do bother with it:

DIR: at the top of the listing
FDISK: describes each disk drive
and confirms removal of a disk drive
FORMAT: prompts you for the label
after DOS creates the disk
LABEL: obvious
TREE: displays the disk's label in its output
VOL: again, obvious

Gotcha! ("The Stumpers")

1 In the CONFIG.SYS file, you'd add the following command:

```
DEVICE=C:\DOS\DRIVER.SYS /D:1 /F:2
```

The DRIVER.SYS device driver creates a "logical" floppy drive. It takes one of your existing floppy drives and adds another drive letter to your system, making that drive double as the logical drive.

Above, /D:1 represents drive B, the 1.4MB floppy. The /F:2 command sets its form factor to equal a 720K floppy. So DOS assumes that the new, logical drive you create is a 720K floppy. If you have a hard drive C, the DRIVER.SYS command will create an extra floppy drive, D (really drive B), but DOS will use it only for 720K floppies. DOS will keep track of everything, just as it does the "phantom B drive" on single-floppy PCs.

2 Another toughie. The idea is to wiggle the current date display from the DATE command. You also need the computer to press the Enter key for you at the DATE command's prompt. Here's how it works:

```
ECHO.|DATE|FIND /I "CURRENT"
```

Start with ECHO. (period but no space after the *O*). This produces the Enter key press. DOS sends it to the DATE command via the pipe (|) character. So far, the DATE command works, displaying the current date and a new date prompt, for which ECHO. presses Enter. DOS sends that output through the FIND filter, where it looks for the word *current*. So DOS fetches the first line of the DATE command, *Current date is*, and displays it; you don't see the rest of it.

3 This requires a number of steps. First, create a file on disk named SETDIR. It contains the following line:

```
SET CURDIR=^Z
```

Use COPY CON to create SETDIR. The file contains the command SET and a space, then CURDIR and an equal sign; press Ctrl+Z to end the file. Second, write this batch file or one like it:

```
COPY SETDIR SETDIR.BAT
CD >> SETDIR.BAT
CALL SETDIR.BAT
DEL SETDIR.BAT
```

In line 1, the SETDIR file you created is copied to a batch file, SETDIR.BAT. In line 2, the current directory is appended to that batch file; if you're in the root directory, the batch file will contain the following line:

```
SET CURDIR=C:\
```

Line 3 calls the batch file: It sets the CURDIR variable, places it into DOS's environment, and sets it equal to the current directory. Line 4 deletes the SETDIR.BAT file created in line 1. That does the job.

Hot One-Liners

1 The key command is as follows:

```
ATTRIB \*.* /S | FIND /C /I "\"
```

The ATTRIB portion of the command lists all files on the hard drive, with their complete paths. The FIND portion of the command counts all lines in ATTRIB's output that contain a backslash—that is, any line that lists a file. The result is the number of files on the hard drive.

2 This is a trick question. Set the CONFIG environment variable equal to one of the four values: MARY, JOHN, WINDOWS, or NETWORK. The solution is to use those names as filenames when you name the second batch file. So you'd have MARY.BAT, JOHN.BAT, WINDOWS.BAT, and NETWORK.BAT. The secret command you then need is as follows:

```
%CONFIG%
```

So if CONFIG is MARY, MARY.BAT would run; for JOHN, JOHN.BAT would run; and so on. Case doesn't matter. ■

(Continued from page 96)

If you set up computers for others to use, Magic Desk is a good choice. You may disable the button and icon editors, add passwords to buttons and command keys, and even keep users from exiting Magic Desk to DOS. When Magic Desk is running, you have complete control over what a user can and can't do with the computer.

Unlike other menuing programs, Magic Desk doesn't remain in memory while it's running. Instead, it launches the action specified by the button you choose and later reactivates itself from a batch file. That leaves a small chance that a user with nimble fingers could hit Ctrl-Break at exactly the right moment and exit from the batch file. But that's unlikely, and extra memory freed up is worth the slight risk you incur.

Give Magic Desk a try. It not only spices up a computer that normally sits at the dull DOS prompt, but also makes your system a little more secure. And it's easy to modify and fun to use. What more could you want from a menuing program?

PRODUCT INFORMATION

Prices shown are for registration only. Most vendors charge additional small fees for shipping and handling, extra disk copies, and printed documentation.

MAGIC DESK 3.01, $29 plus $4 shipping
Virtual Magic Software
P.O. Box 12264
Huntsville, AL 35815
mail inquiries only

PKZFIND (File Finder Plus 1.1), $25
PKWARE Inc.
7545 North Port Washington Road
Glendale, WI 53217
mail inquiries only

SEEKEASY 7.07, $39.95
Correlation Systems
P.O. Box 39
Lomita, CA 90717
310-833-3462

Searching High and Low

In the days of 20MB hard drives, it was difficult to misplace a file. After all, how many subdirectories can you squeeze into 20MB? But today, .5GB hard drives are common, and so are lost files.

When you can't find a file you know exists, you need a search program. Robert C. Casas of Glenview, Illinois, nominated a pair of complementary programs for your consideration:

> *The first, and my favorite, is a 1989 program from* PKZWARE *called* ***PKZFind*** *(also called File Finder Plus 1.1). It searches for regular and compressed files by name and uses the standard DOS wildcards, * and ?. As it displays each filename, it prompts "More? (Y,N,J)." If you press J, the program jumps to the subdirectory containing the file.*

PKZFind (look for PKZF11.EXE on the *DOS World* BBS) is small, fast, and handy. It locates ordinary files, as well as files hidden within ZIP files created with any version of PKZIP. You may restrict the kinds of files for which it searches. The manual is only a few pages long and very clear, but you probably can get by without it if you're familiar with PKZIP and PKUNZIP. If you know how to get on-line help with those programs, you'll know how to do it with PKZFind: Just add /? on the command line.

DOS TIP

CAN THE CLUTTER

Normally, when you type SET at the command prompt, DOS displays a list of all currently assigned environment variables. If you use the environment often, that list can be long. For convenience, I use the following two-line batch file, ENVIEW.BAT, to display a single environment variable directly from the command prompt:

```
SET | FIND /I "%1"
```

When I want to view an environment variable, I invoke ENVIEW.BAT and provide a string for which to search. To look at the contents of the COMSPEC environment variable, for example, I type the following line:

```
ENVIEW COMSPEC
```

Because ENVIEW.BAT relies on DOS's FIND command, it lists all variables containing the designated search string. This means, of course, that unless you provide a unique search string, the program displays more than one variable. Still, it screens out most of the clutter, which I find helpful when I need to install or troubleshoot an application.

—John Wolfskill

You can get fancier shareware and commercial programs, but none is significantly faster or easier to use than this program. Although it's five years old, it still ranks as one of the best of the "where is" programs for searching by filename. I strongly recommend PKZFind, especially if you use PKZIP to compress and store files on your hard drive.

The second file-finder nominee searches for files, but it does so by examining their contents in addition to their filenames:

I've tried several text-search programs, but none of them has the "fuzzy" search capabilities of ***SeekEasy 7.07****. It's a more complex program than PKZFind, so it takes longer to do its job. On my 66MHz 486DX2, the program can take as long as seven and a half minutes to search 240MB of data.*

But unlike other text-search programs, SeekEasy can find variants of the search string, and the search string doesn't have to be at the start of a word. This program is small in terms of hard-disk space, sophisticated in its search capabilities, very effective, and relatively inexpensive to register.

SeekEasy (look for SEEKEZ.ZIP on the *DOS World* BBS) searches the files you specify for a text string. Unlike other programs that report only exact matches, SeekEasy finds approximate matches. For example, when I searched the text files on my hard drive for my last name, *Brothers*, it also reported partial matches for such words as *others*, *other*, *there*, and *wither*.

This fuzzy search capability makes SeekEasy powerful. During its search, it finds the best matches, as many as 200 of them. It then lets you review the files it's found. You may scroll through each file and mark blocks of text to print or save to a file. Locating the matches is easy, because SeekEasy highlights each match and partial match in a file.

I like SeekEasy, although I find it awkward to use. Its ability to find partial matches sets it apart from most shareware and many commercial search programs. I'd appreciate a few improvements, however. First and foremost, the program needs a way to turn off the fuzzy search so that you may conduct a standard text search. Sometimes I want the closest approximation to my search text; other times I know exactly which text I want to find.

Second, I'd like a way to reduce the number of matching files. If I'm searching for an unusual string, for example, I may know that only five of my files contain it. I don't need to bother with close matches.

I'd also like the program to run in 50-line mode on a VGA system. When you view a matching file, only 12 lines of its text fit on screen, because the other lines contain program information. It would nice to see more of the file at once.

Finally, I'd like to see better documentation and a cleaner user interface. Too much happens at the same time, so the screen almost always feels cluttered, and the documentation is difficult to read.

Still, SeekEasy is a handy program. If you need to search your files for data, it's a good place to start your search for a data finder. ■

Contributing Editor Hardin Brothers has been working with computers and writing about them for 15 years.

SHARE THE WEALTH

"Shareware Exchange" invites you to send a copy of your favorite shareware program, along with a description and an explanation of why you like it (500 words or less), to Shareware Editor, *DOS World*, 80 Elm St., P.O. Box 802, Peterborough, NH 03458-0802. Tell us how we can obtain a copy of the program. We'll pay contributors $50 for each program featured in this column. Please don't send us shareware you've written—we want recommendations from users, not authors. Contact us on CompuServe at 75300,2361 or on the *DOS World* bulletin-board system (BBS) at 603-924-3181.

All programs featured in "Shareware Exchange" are available electronically from the *DOS World* BBS. There are no connect-time charges—you pay only for the phone call. Set your communication program to 8 data bits, no parity, 1 stop bit (8,N,1). Then dial 603-924-3181 and wait for the "Connect" message. If you're a first-time user, the system will ask you to enter your name and choose a password. Then it will display a general information screen, followed by a questionnaire requesting your address, phone number, and so on. (You must answer the questionnaire to set up your user account and gain access to the BBS.)

From this point, on-screen prompts are the same for all users. A series of messages presents the latest BBS news. Pressing Enter after each message takes you to the next screen. When you reach the Bulletin Menu, read Bulletin #1 if you need help downloading files. After the Bulletin Menu comes the Main Menu. Press F at the Main Menu to go to the File Menu. At the File Menu, the quickest way to download files is to press D and type in the filenames. If you don't know the filenames or want to browse through them, press L to list them. While they're listed on screen, you can press D to download files or M to mark them for later downloading. You can find complete information on listing, marking, searching for, and downloading files in Bulletin #1.

Magic Desk, PKZFind, and SeekEasy are all in File Area 5: Shareware Utilities. In addition, most of the programs described in "Shareware Exchange" can be found on major on-line services and local BBSes.

—Eds.

How To Use

REPLACEABLE TEXT

Articles in DOS World will often give you a command that includes text you must replace with your own information. This replaceable text is in italics. For example, in the following command, you'd replace filename with the name of your own file:

```
COPY A:filename B:filename
```

THE AUTOEXEC. BAT FILE

Most people have a batch file called AUTOEXEC.BAT on their hard disk. If you want to look at it, first go to your root directory by typing CD\. Type DIR to make sure AUTOEXEC.BAT is there. Then type the following command:

```
TYPE AUTOEXEC.BAT | MORE
```

A simple AUTOEXEC.BAT file might look like this:

```
@ECHO OFF
PROMPT $P$G
PATH=C:\DOS;C:\WINDOWS;C:\WP51;C:\BAT
C:\DOS\SMARTDRV.EXE
C:\MOUSE\MOUSE.COM
C:\DOS\DOSKEY.COM
SET TEMP=C:\TEMP
```

When a *DOS World* article instructs you to modify your AUTOEXEC.BAT file, always make a backup copy of the original AUTOEXEC.BAT first. The most common names for your backup copy are AUTOEXEC.BAK or AUTOEXEC.BK. The latter lets you save different versions of your backups—for example, AUTOEXEC.BK1 and AUTOEXEC.BK2. You create a backup copy with the following command:

```
COPY AUTOEXEC.BAT AUTOEXEC.BAK
```

Also, you should have an emergency boot disk available whenever you modify AUTOEXEC.BAT. (See the accompanying section on the facing page, top.) It will let you access your hard drive in case you make an error that locks up your computer. Changes you make to AUTOEXEC.BAT won't take effect until you restart your computer.

THE CONFIG.SYS FILE

You also have a file in your root directory called CONFIG.SYS. Like AUTOEXEC.BAT, this file is in ASCII, and you can view your CONFIG.SYS file with the TYPE command. A typical CONFIG.SYS might look like this:

```
DEVICE=C:\DOS\HIMEM.SYS
DEVICE=C:\DOS\EMM386.EXE NOEMS
DOS=HIGH,UMB
FILES=50
BUFFERS=10
SHELL=C:\DOS\COMMAND.COM
  C:\DOS\ /E:1024 /P
DEVICE=C:\DOS\ANSI.SYS
DEVICE=C:\DOS\SETVER.EXE
```

The rules for handling CONFIG.SYS are the same as they are for AUTOEXEC.BAT: Always back up the original file before you modify it and always have an emergency boot disk available. As with AUTOEXEC.BAT, changes you make to CONFIG.SYS won't take effect until you restart your computer.

ANSI.SYS AND THE ESCAPE CHARACTER

When an article says you must have ANSI.SYS installed, it means that the MS-DOS file ANSI.SYS should be in your DOS directory, and the following line should be in your CONFIG.SYS file:

```
DEVICE=C:\DOS\ANSI.SYS
```

Some articles that discuss ANSI.SYS will also ask you to create a batch file that uses the escape character. Unfortunately, there's no uniform method of doing so. If you use EDIT, the text editor that comes with MS-DOS, you can make an escape character by pressing Ctrl+P and then the Esc key. The escape character appears on screen as a small left-pointing arrow. If you're using another text editor or word processor, check its instructions for information on how to enter the escape character.

BATCH FILES

A batch file is a text file that tells MS-DOS to do a series of tasks. The filename of a batch file always ends with the extension .BAT.

A batch file must be in plain-text format. For example, a batch file might consist of the following lines:

```
CD\
DIR /S /P
```

This batch file moves you to the root directory (CD\) and then gives you a list of all files in all directories (/S), pausing after each full screen (/P).

Every batch file needs a name. In such cases, you should pick your own name. Batch-file names carry the same limitations as any other DOS filename; you're limited to eight characters, plus a three-character extension. A batch-file name must always use the .BAT extension.

To avoid confusion and unexpected results, don't give any batch file the same name as another program or DOS command. For example, VCOPY.BAT is an acceptable name for a batch file, but not COPY.BAT or XCOPY.BAT, because COPY and XCOPY are the names of DOS commands. To run or execute a batch file, type its name at the DOS prompt. For example, to run a batch file called VCOPY.BAT, type VCOPY at the DOS prompt.

Creating and Saving

Using EDIT. If you have DOS 5 or later, you can create a batch file using EDIT. EDIT usually resides in your DOS directory. Type EDIT and enter your batch file. When you're done, press Alt+F and choose the Save option. Type the name of your batch file (make sure you add the extension .BAT) and press the Enter key.

Using other word processors. Most word processors don't save files in plain text; they include other characters, such as control characters that handle such matters as page formatting and typefaces. Most word processors, however, do give you an option to save in plain text. The procedure varies from one word processor to the next. For example, when you save a file in WordPerfect 5.1, you choose ASCII Text (DOS) as your Format option.

This Magazine

MAKING AN EMERGENCY BOOT DISK

Sometimes a DOS World article will suggest that you create a bootable floppy—a floppy disk that serves as an emergency system disk. That is, if your computer for some reason can't access your hard drive, you can start your computer from the emergency floppy. You should always have an emergency system disk available, but it's particularly important when you modify AUTOEXEC.BAT or CONFIG.SYS because you may change those files in such a way that your computer won't start from the hard drive. To create a system disk:

1. **Insert a floppy disk in drive A.**
2. **At the command line, type FORMAT A: /S (all existing information on the floppy will be lost).**

DOS first formats the disk. Then it copies three DOS system files to the floppy disk: IO.SYS, MSDOS.SYS, and COMMAND.COM.

The first two are hidden files; you won't see them if you type DIR A:. If you have the disk-compression program DoubleSpace on your computer, the FORMAT command above will also copy DBLSPACE.BIN, a third hidden file, to the floppy disk.

After you've created your system disk, you should copy a few other basic files to your floppy.

Go to your DOS directory and copy the following files: FORMAT.COM, EDIT.COM, EDIT.HLP, QBASIC.EXE, UNDELETE.EXE, CHKDSK.EXE, and FDISK.EXE.

DEBUG SCRIPTS

A Debug script is a list of assembly-language instructions you convert to an executable program using the Debug program in your \DOS directory.

Creating the script. A Debug script must be in plain text. The procedure for creating the script is the same as for creating a batch file. You can use DOS's EDIT program, or you can use a different text editor or word processor and save the script in plain text format.

Creating an executable program. After creating and saving the script, type the following command at the DOS prompt:

```
DEBUG < filename
```

where *filename* is the name of the Debug script you created.

For example, if the name of your Debug script is KEYPRESS.SCR, you'd type this:

```
DEBUG < KEYPRESS.SCR
```

at the DOS prompt. The executable program created by Debug will have the extension .COM. The name of the executable file is determined by the contents of the script. Our convention is to use the same name for the executable file as we do for the script. Thus, the executable file created by KEYPRESS.SCR will be named KEYPRESS.COM. Once you've created the executable file, you run it by typing its name at the DOS prompt. To run KEYPRESS.COM, type `KEYPRESS`.

PATHS AND THE PATH STATEMENT

DOS World articles often tell you to make sure that a particular file is in a directory included in your PATH statement. This lets you runs a .COM, .EXE, or .BAT file from any directory on any drive.

For example, an author might tell you to create a batch file called TEST.BAT, put it into a subdirectory called \BAT, and put the subdirectory into your PATH statement. You can then execute TEST.BAT by typing TEST from anywhere on your drives, without having to change to the \BAT directory first.

The PATH statement is a line in your AUTOEXEC.BAT file. It gives DOS a list of directories to search for requested files. Here's an example:

```
PATH=C:\DOS;C:\WINDOWS;C:\BAT
```

When you type TEST at the DOS prompt, DOS looks for the program first in the current directory, then in the root directory, and then, in order, the \DOS, \WINDOWS, and \BAT directories. When it finds TEST.BAT in the \BAT directory, it executes the batch file.

Continued on next page

BASIC DEFINITIONS

DOS Prompt. Also known as the *command prompt*. By default, the DOS prompt looks like this: C:\>. This is where you type the instructions to run programs or DOS commands.

Boot, boot up, reboot. The process of starting or restarting your computer. Turning on your computer is *booting* or *booting up*. Pressing the key combination Ctrl+Alt+Del restarts, or *reboots* your computer. So does pressing the reset button, if your computer has one.

Extensions. When we refer to a program by its common name (for example, the DOS command FORMAT) without an extension, you can assume that the extension is .COM or .EXE. When we refer to a batch file, we always include the extension .BAT. QBasic program names must always include the .BAS extension.

ASCII. American Standard Code for Information Interchange. For our purposes, an ASCII file is a plain text file, one that consists entirely of the characters you see on your keyboard.

Directories. Your hard drive has a main directory called the *root* or *home* directory. Directories created off the root directory are called *subdirectories*. When we provide the name of a subdirectory, it will look something like this: \WORD\FILES. Here, the root directory has a subdirectory called WORD, which in turn has a subdirectory called FILES.

File placement. We assume that the following files are in your root directory: AUTOEXEC.BAT, CONFIG.SYS, and COMMAND.COM. We also assume that your DOS files are in a DOS subdirectory, usually called \DOS.

Keystroke combinations. When you should hold down one key while pressing a second, we indicate it this way: Alt+F4 (press the Alt key and hold it down while you press the F4 key). When you should press one key, release it, and press another, we indicate it this way: Alt, F4 (press the Alt key, release it, then press the F4 key).

QBASIC PROGRAMS

Nearly every issue of *DOS World* includes one or more listings for QBasic programs. QBasic is the programming language included in all versions of MS-DOS since version 5. The name of a QBasic program always ends with the extension .BAS.

Creating and Saving

Typing in the listing. Begin at the DOS prompt by typing `QBASIC` and pressing Enter to start QBasic. Now type in the lines of a QBasic program listing as printed in the magazine, pressing Enter at the end of each line. Note that when a line in the listing is indented two spaces from the line above it and doesn't start with a QBasic command or keyword, this indicates a continuation of the previous line. Other indentations, or no indentation at all, indicate the start of a new line.

Subroutines and functions. QBasic program listings often include subroutines and functions, and typing them is confusing at first. Subroutines and functions begin with a line containing the keyword SUB or FUNCTION, such as the following:

```
SUB DRAWBOX
```

or

```
FUNCTION GETCOUNT
```

Note that when you type a SUB or FUNCTION line and press Enter, all other lines you've typed will disappear from view. This can be disconcerting for beginning programmers.

There's nothing to worry about—your listing is safe. To avoid screen clutter, QBasic simply hides other parts of your listing when you're typing in a subroutine or function. To see the other parts of your program, open the View menu at the top of the QBasic screen, then select SUBS. The SUBS dialog box will then appear, letting you select the part of the program listing you want to view.

Saving a listing. Save your partially completed listing as you go along, rather than waiting until you've typed in the whole thing. To save, open the File menu, choose Save, and type in a filename when QBasic prompts you. We suggest using the filename specified in the magazine article. Subsequent saves of your listing won't prompt you for a filename, but will instead use the filename indicated the last time you saved the listing.

Running a Program

After you've typed in the entire listing and saved it a final time, you can run the program by selecting Start from the Run menu or pressing Shift+F5. If QBasic finds an error in your listing, it will stop the program and highlight the line where it found the error.

To run a QBasic program (a .BAS file) stored on your hard drive, start QBasic, then select Open from the File menu. Choose from among the .BAS files displayed in the OPEN dialog box to load the program into QBasic, then select Start from the Run menu or press Shift+F5.

Typing and debugging a long listing is a time-consuming process. If you have a modem and want to avoid typing in our QBasic listings, they're always available on *DOS World*'s bulletin-board system (BBS) at 603-924-3181. ■

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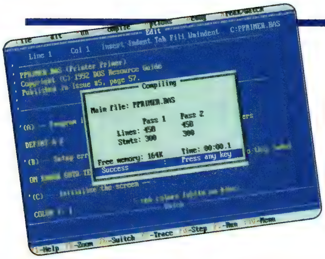

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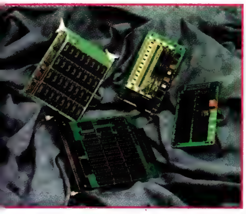

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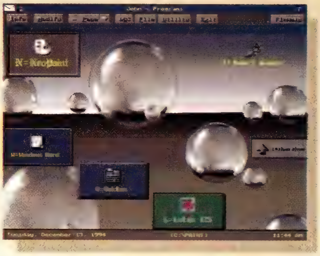

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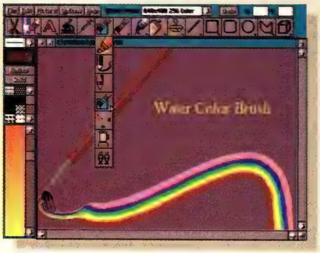

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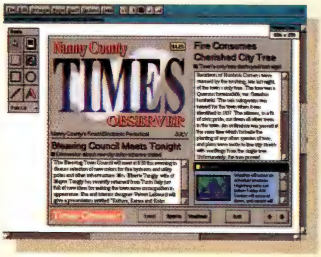
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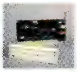

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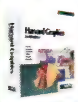

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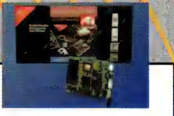

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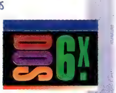

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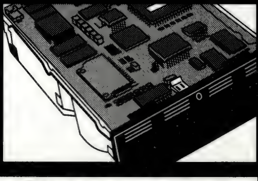

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SCSI			
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1052MB	8.6ms	70G8512	$699
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Plextor	PX43CH	4X	150ms	$475
NEC	CDR510	3X	195ms	$345
Toshiba	XM3401	2X	200ms	$269
Toshiba	XM4101	2X	320ms	$215
Teac	CD50	2X	265ms	$209
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XM3401	$425	$549	$425	$479
CDR510	$499	$619	$499	$559
PX43CH	$659	$779	$659	$699
CDR900	$1129	$1249	$1129	$1189

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A1542CBASIC 16Bit SCSI	$225	$215
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A2842 VESA SCSI	$279	$269
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ALPHA RESEARCH CACHING CARDS		
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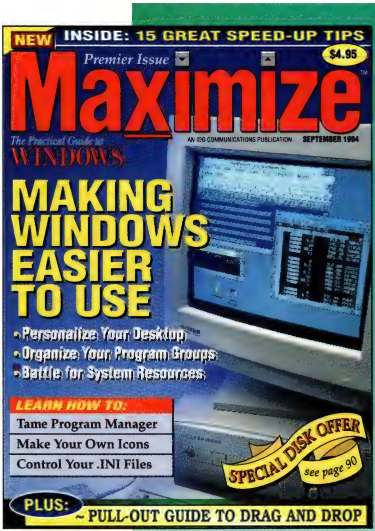
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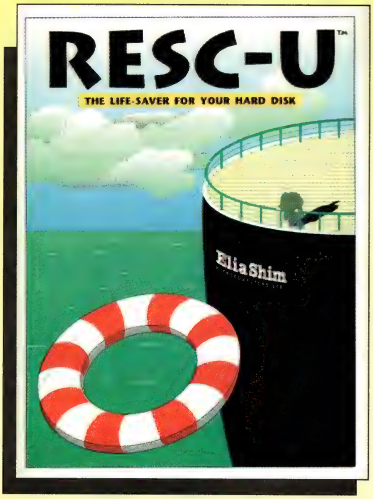

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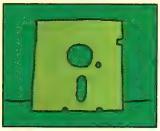

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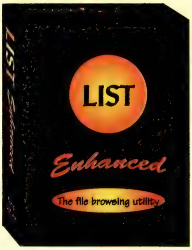

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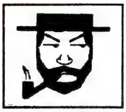

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If you don't have time to waste tracking down the programs and files you want to use, take a closer look at this month's collection of shareware programs.

The Magic Touch

Great minds think alike, at least where readers' shareware recommendations are concerned. Three people submitted separate nominations for the menuing system **Magic Desk**, all citing the program's outstanding ease of use. Mike Walton of Greenwood, Kentucky, decribes its features best:

Over the past couple of years, I've been looking for a good menuing program for beginners. I wanted something that was easy to use and didn't require a mouse or Windows. I also wanted something that was easy to set up, manage, and modify. Magic Desk (also known as ToyBox) is all that and more. Once you unZIP it, it's ready to run. You tell it where your programs are and how you want to run them, using simple English, not "wonk language." It features password protection, a DOS shell, and a text-file viewer. My favorite option keeps "children" from exiting the program and deleting files at will. I demonstrated the program to our users club, and it was the most popular item for months!

I've had fun working with Magic Desk's menus. The program (look for MAGICDSK.ZIP on the *DOS World* BBS), which runs in graphics mode, presents you with an icon for each menu choice. An icon may lead to another menu of icons or run an EXE, COM, or BAT file. When the program you select ends, you return to Magic Desk.

The effect is a little like working in Windows, except that the icons are larger and programs don't run in a window. You may use a mouse or the cursor keys to select an icon or menu choice. Either way, the program is quick, intuitive, and flexible. It includes a button editor that lets you create or modify buttons and determine the actions that occur when you choose them. You may build icons from scratch (using the program's icon editor), use any of the 35 icons included with the program, or import Windows icons stored in ICO format.

(Continued on page 76)

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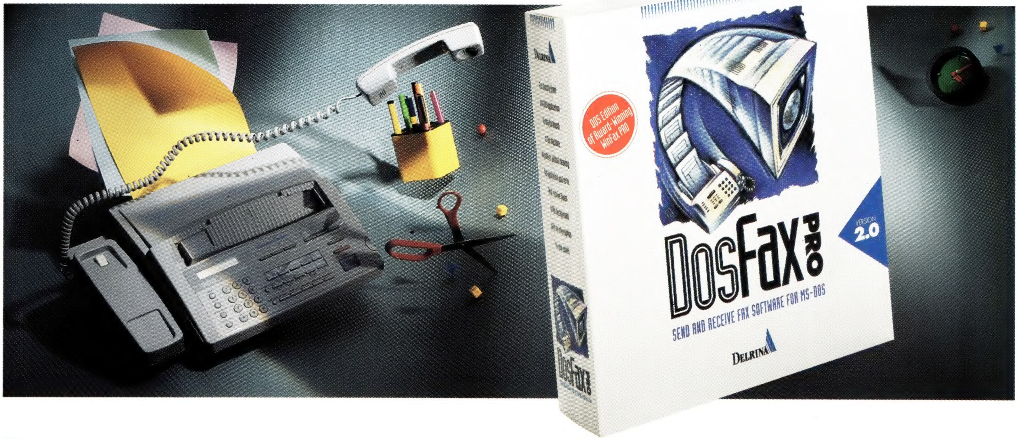
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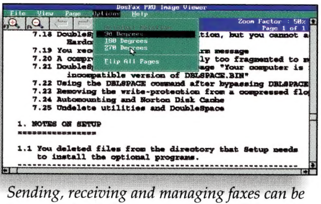

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        incompatible version of DBLSPACE.BIN"
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1.1 You deleted files from the directory that Setup needs
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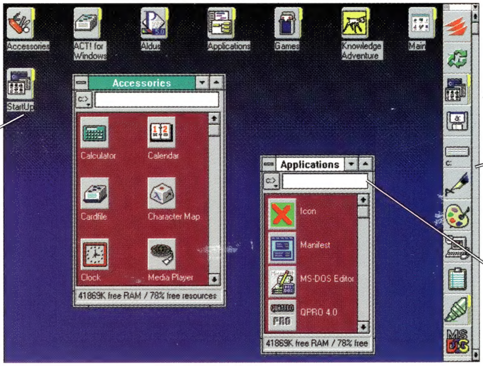

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